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High Manganese Steel Castings

Origin and Properties of the 1.25 Per Cent Type—Summary of Over 1800 Tests

BY JOHN HOWE HALL

IN December, 1906, when the author was first employed by the company with which he has since been associated, he was assigned the task of assisting in the development of "a better grade of cast steel" for the buckets used on the gold dredges of California and Alaska. These castings as then made weighed about 800 to 1000 lb. each, and a chain of from 50 to 75 of them, coupled together by means of heavy pins, made up a gigantic bucket elevator, dredging 40 to 50 feet below the surface of the water, and taking up everything in front of the dredge down to bed rock. As the gold dredge was then a somewhat crude device mechanically, and much of the ground that had to be dug was far from easy to move, the stresses to which the castings were subjected in service were terrific, and the wear of the steel was very rapid.

In an effort to satisfy the demands of the dredge operators for "a steel that would not wear out so fast," the carbon content of the metal had been raised year by year, until in 1906 it reached 0.60 per cent, with the result that during that year and 1907 the breakage of bucket castings in service reached the proportions of an epidemic, and in the words of the irate dredge men, "something radical had to be done right off."

A review of the history of the business showed that from 1902 to 1905, steels of about 0.35 to 0.45 per cent carbon had been furnished that gave satisfaction as far as breakage was concerned, but wore too rapidly to suit the dredge men. The 0.60 per cent carbon steel made during 1906 and most of 1907, on the other hand, had generally broken before it had been in service long enough to wear very much. As a first step, therefore, late in 1907 0.35 to 0.45 per cent carbon steel was made standard for dredge buckets and its use was continued until the fall of 1908, when heat treatment methods had been so far perfected that it was considered advisable to use 0.50 carbon steel. These castings were heated for 4 hr. at 900 deg. C., air cooled, and again heated to 700 deg. C. for 6 hr. The properties of the steel so treated are shown in the accompanying tables and figures, and, as will be readily seen, it possessed a combination of strength and ductility that promised to give a casting that would not break, and would wear as slowly as could reasonably be expected.

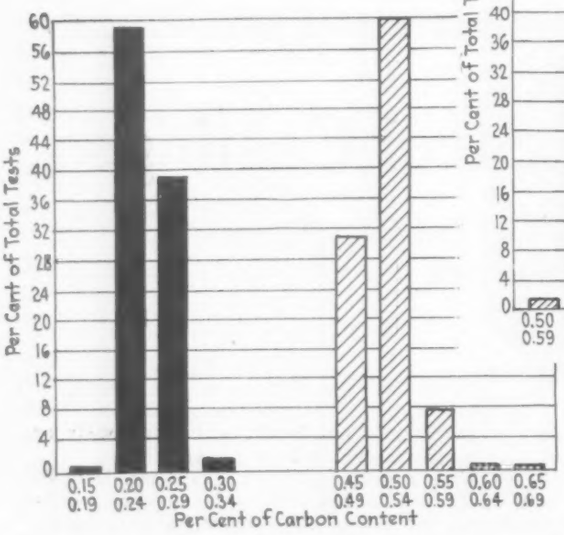
As so often happens, however, the demands made upon a dredge bucket had increased enormously compared to what was expected of them when the dredging business was younger, the dredges were larger, the buckets of greater capacity, and the operators were driving them harder and harder and dredging to greater depth for pay dirt at bed rock, in the effort to handle more ground and decrease dredging costs. The 0.40 carbon steel did not stand up as it had in 1902, the high grade 0.50 per cent steel did no better, the breakage of buckets continued, and the demand for a better steel grew even more insistent.

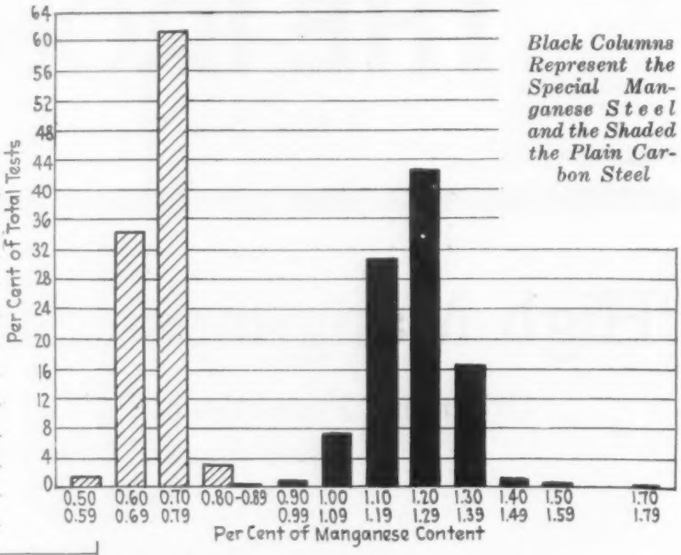
Realizing that nothing but a "super-steel," to use a somewhat hackneyed expression, would suffice to solve the problem, the author wrote out a set of specifications for tensile strength, elastic limit, extension, reduction of area and bend as a goal to strive for, without much hope of being able to meet the figures. In the next three months, these specifications were stiffened up three times, so extraordinary were the results attained by the adoption of a steel of special analysis, heat treated by quenching in water and "drawing back." This steel was first produced regularly in April, 1909, and in the next five years some 1500 tests were made from coupons attached to the castings and treated with them.

To insure the shipment of none but the very best material, a coupon was attached to every casting, and for nearly two years every coupon was tested. This was later reduced to one coupon tested from each 3-ton heat of steel, and finally to one coupon from each annealing furnace charge. Records of the tests were carefully kept on individual cards, on which was also pasted a photomicrograph of the steel, and the data on chemical composition, heat treatment, etc., were included with the test results. Probably such a collection of information, so recorded as to be readily examined and tabulated, is available in few, if any, other foundry laboratories, and the author has assumed the rather burdensome task of condensing all the tests into

FOR several years the subject of 1.25 per cent manganese steel has been an important one. It came into prominence particularly during the war. In recent years it has found favor among steel users and is now being tried in the shape of forgings, rails and in other forms besides castings. The author of this article, who is metallurgist, Taylor-Wharton Iron & Steel Co., High Bridge, N. J., is one of the best equipped authorities to discuss this subject. This article summarizes over 1800 tests on castings made during a number of years. Comparisons are made with other steels.

Fig. 1—Comparative Percentages of the Total Tests of Special Manganese and Plain Carbon Steels Which Fell Within Certain Ranges of Carbon Content





Black Columns Represent the Special Manganese Steel and the Shaded the Plain Carbon Steel

Fig. 2 (Above)—Comparative Percentages of the Total Tests of Special Manganese and Plain Carbon Steels Which Fell Within Certain Ranges of Manganese Content

the tables and charts accompanying this article, in order to demonstrate the high average performance possible in the manufacture of steel of this class.

It should not be assumed that the production of this steel ceased at the end of the five years here summarized, for it has been made regularly ever since, and during the great war a very large tonnage was produced for ordnance work. The test data, however, are not so assembled as to be readily available for tabulation, especially the great mass of tests made during the war. A few recent tests of the material are given in Table 14, for ready comparison with the more extensive data in the other tables, from which it will be seen that the high average qualities of the older material are exhibited also by the steel being produced today.

After about 1913, 12 per cent manganese steel was used for dredge buckets, in order to take advantage of its superior wear-resisting qualities, and the 1.25 per cent manganese steel was used for other purposes. In another place[1] photographs have been published showing to what small dimensions the special steel buckets could be safely worn without fear of breakage; but several years after they had been superseded by 12 per cent manganese steel castings, a noteworthy tribute to the quality of that steel was paid by one of the California gold dredging companies. They were in need of several large tumblers, weighing about 25,000 lb. each, and sent the order all the way East. On account of the large size of the castings, permission was asked to have them cast in another foundry, of regular acid open-hearth steel. This was promptly and emphatically refused, on the ground that perfectly good open-hearth steel could be obtained right at home in California. "But," said the customer, "we used to obtain from you a steel in buckets and smaller tumblers that was better than any other cast steel that ever went on our boats. If you can make these important tumblers out of that steel, execute the order; if not, cancel it and we will obtain ordinary cast steel locally." The order was executed in the special steel.

Quenching a steam shovel tooth some 6 in. x 8 in. in cross section at its largest point without cracking it is not the easiest thing in the world to do, but it has been successfully accomplished in hundreds of cases, in order to secure the very high elastic limit in the steel that results from quenching. Tables 14-A and 14-B show two tests from a single heat of this steel, one quenched in water from the anneal, and one air cooled after annealing, both of course being drawn back to the proper temperature. The much higher elastic limit obtainable by quenching is at once apparent, and it should also be noted that this is obtained without loss of ductility. Indeed, the water quenched material is if anything the tougher. In a great number of cases breakage of heavy steam shovel teeth has been eliminated by the use of this special steel.

Since the publication of several papers and articles[1] describing this steel, it has been used to an increasing extent, not only by the company where it originated,

[1] "Heat Treatment of Cast Steel"—Hall, Nissen and Taylor, *Proceedings* American Inst. of Min. and Met. Engrs., Vol. LXII (1920), page 353.

Table 1-A—Carbon Content—Special Steel

Carbon Per Cent	No. of Tests	Per Cent of Total
0.15—0.19	11	0.76
0.20—0.24	882	59.2
0.25—0.29	577	38.8
0.30—0.35	18	1.24
Total	1,488	100.00

Table 1-B—Carbon Content—Ordinary Steel

Carbon Per Cent	No. of Tests	Per Cent of Total
0.45—0.49	104	30.9
0.50—0.54	203	60.2
0.55—0.59	26	7.7
0.60—0.64	2	0.6
0.65—0.70	2	0.6
Total	337	100.00

Table 2-A—Manganese Content—Special Steel

Manganese Per Cent	No. of Tests	Per Cent of Total
0.80—0.89	1	0.07
0.90—0.99	15	1.01
1.00—1.09	106	7.12
1.10—1.19	465	31.25
1.20—1.29	630	42.34
1.30—1.39	243	16.32
1.40—1.49	22	1.48
1.50—1.59	5	0.34
1.60—1.69	0	.....
1.70—1.80	1	0.07
Total	1,488	100.00

Table 2-B—Manganese Content—Ordinary Steel

Manganese Per Cent	No. of Tests	Per Cent of Total
0.50—0.59	6	1.8
0.60—0.69	115	34.1
0.70—0.79	207	61.4
0.80—0.90	9	2.7
Total	337	100.0

Table 3-A—Tensile Strength—Special Steel—Quenched and Drawn

Tensile Strength	No. Tests 1st 9 Mo.	2nd Yr.	3rd Yr.	4th and 5th Yrs.	Total	Per Cent of Total Tests
65—70000	5	0	0	0	5	0.34
70—75000	16	10	0	1	27	1.80
75—80000	89	93	15	3	200	13.48
80—85000	187	333	43	5	568	38.20
85—90000	135	259	61	10	465	31.21
90—950000	38	94	29	11	172	11.58
95—100000	3	32	6	2	43	2.85
100—105000	0	4	3	1	8	0.54
Total	473	825	157	33	1,488	100.00

Table 4-A—Elastic Limit—Special Steel—Quenched and Drawn

Elastic Limit	No. Tests 1st 9 Mo.	2nd Yr.	3rd Yr.	4th and 5th Yrs.	Total	Per Cent of Total Tests
35—40000	1	0	0	0	1	0.06
40—45000	6	4	1	0	11	0.74
45—50000	65	91	8	1	165	11.11
50—55000	283	349	62	8	702	47.26
55—60000	111	254	48	7	420	28.27
60—65000	4	89	26	10	129	8.70
65—70000	1	34	9	6	50	3.40
70—75000	0	2	3	1	6	0.40
75—80000	0	1	0	0	1	0.06
Total	471	824	157	33	1,485	100.00

Table 3-B—Tensile Strength—Ordinary Steel—Air Cooled and Drawn

Tensile Strength	No. Tests	Per Cent of Total Tests
65—70000	1	0.30
70—75000	1	0.30
75—80000	32	9.50
80—85000	154	45.62
85—90000	111	33.00
90—95000	33	9.80
95—100000	5	1.48
Total	337	100.00

Table 4-B—Elastic Limit—Ordinary — Steel—Air Cooled and Drawn

Elastic Limit	No. Tests	Per Cent of Total Tests
35—40000	2	0.6
40—45000	45	13.4
45—50000	214	63.7
50—55000	70	20.8
55—60000	5	1.5
Total	336	100.00

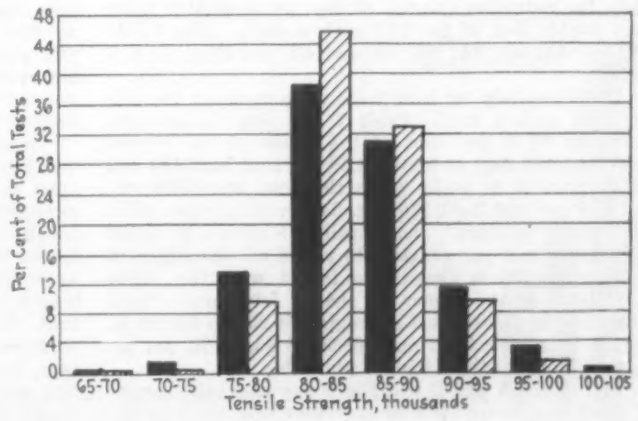
and received its trade name of "Orbit" steel, but by other makers who have applied it with striking success under various names to a number of applications where a very high grade cast steel is required. For parts subjected to heavy stresses in railroad cars, heavy machinery, trucks and tractors, etc., its use has eliminated or minimized breakage, and in the next few years the tonnage of this steel made is expected to increase.

Heat treated by quenching in oil or water and reheating, the structure of the steel is sorbitic; if air cooled and reheated, the structure consists of very finely divided pearlite and ferrite. With a "plain anneal," its microstructure resembles that of ordinary cast steel. As a rule, either quenching or air cooling followed by a reheating is the treatment preferred.

The tables and charts require little comment. For comparison, an 0.50 per cent carbon cast steel, heat treated as described above, was chosen, as a number of tests were readily available for tabulation. This steel had a structure consisting of very finely divided pearlite and ferrite, unlike ordinary cast steel, whose microstructure after annealing is relatively coarse. As a result, its extension and reduction of area average considerably higher than would those of 0.50 carbon cast steel, given a plain anneal. Good as these properties are, however, they are far excelled by those of the special steel water quenched and reheated, as a glance at the charts will show. It will be seen that the 0.50 carbon steel and the special steel have almost identical tensile strength, about 80,000 to 90,000 lb. per sq. in. The elastic limit of the special steel, however, is about 5000 lb. per sq. in. higher, its elongation about 28 per cent compared to about 20 per cent for the 0.50 steel,

[2] John H. Hall—"Heat Treatment of Hypo-eutectoid Carbon Steel Castings," *Proceedings* A. S. T. M., Vol. XIII (1913) page 514.
John H. Hall—"Shock Tests of Cast Steel"—*Proceedings* A. I. M. and M. E., Vol. XLVII (1913) page 482.
John H. Hall—Discussion of paper "Heat Treatment of Steel Castings" by Young, Pease and Strand, *Proceedings* A. I. M. and M. E., Vol. L (1914) pages 424 and 433.
Hall, Nissen and Taylor—"Heat Treatment of Cast Steel," *Proceedings* A. I. M. and M. E., Vol. LXII (1920) page 353.

Fig. 3—Percentage of the Total Tests of the Special Manganese and High-Carbon Steels at Certain Ranges of Tensile Strength (at Right)



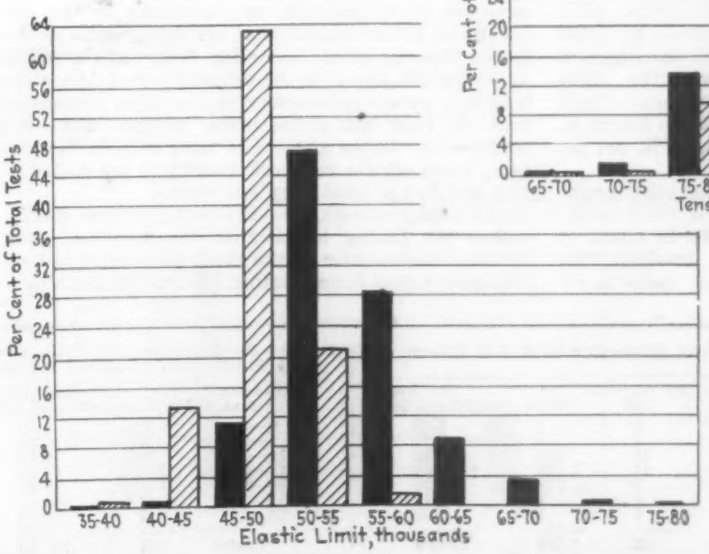


Fig. 4 (Left)—Percentage of the Total Tests of the Special Manganese and High-Carbon Steels at Certain Ranges of Elastic Limit. The dark columns are the 1.25 per cent manganese steel with carbon 0.25 per cent, and the shaded portions are the 0.50 per cent carbon steel with a manganese content of 0.60 to 0.80 per cent

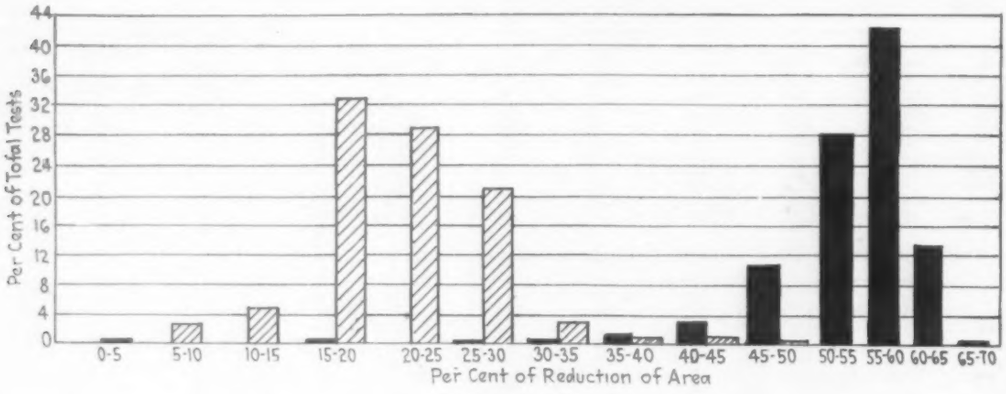


Fig. 6—Percentage of the Total Tests of the Special Manganese and High-Carbon Steels at Certain Ranges of Reduction of Area. The dark columns in both are the 1.25 per cent manganese steel with carbon 0.25 per cent, and the shaded portions are the 0.50 per cent carbon with a manganese content of 0.60 to 0.80 per cent

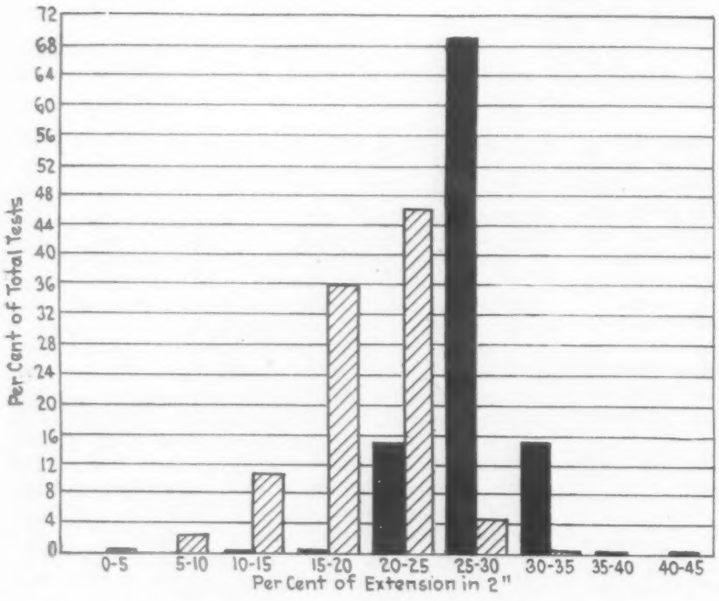


Fig. 5 (Left)—Percentage of the Total Tests of the Special Manganese and High-Carbon Steels at Certain Ranges of Expansion in 2 In.

while the reduction of area of the special steel is more than double that of the 0.50 carbon steel. (See tables 3A, 3B, 4A, 4B, 5A, 5B, 6A and 6B and Figs. 3, 4, 5 and 6.)

Unfortunately, no bend tests were made on the 0.50 per cent carbon steel. Table 7 and Fig. 7, however, show the 92.75 per cent of the bends of the special steel bent 180 deg. at least, 41.59 per cent bent 180 and either cracked or broke when the bend was flattened, and 46.8 per cent bent 180 deg. flat on themselves without sign of rupture. Incidentally, it should be noted that it was not our practice to round off the edges of the bending bars; they were tested with the edges sharp just as the planer or shaper left them. Such toughness in a cast steel averaging 50,000 to 60,000 lb. per sq. in. elastic limit and 80,000 to 90,000 lb. per sq. in. tensile strength is truly remarkable.

In Tables 8A and B and Fig. 8 are given the results of shock toughness tests of the two steels made in the Fremont machine. The results are given in terms of kilogrammeters of work absorbed in breaking the standard Fremont bar, no attempt being made to reduce the figures to kgm. per sq. cm. Two things are at once apparent from an examination of this table and chart; first, that the shock resisting qualities of the special steel are far higher than those of the 0.50 per cent steel; second, that the shock test figure varies over quite a wide range.

Careful checks of the performance of this machine on identical test pieces cut from a single bar of rolled steel have shown that concordant results cannot be expected of it, so that the variations in the shock toughness of the special steel are due at least as much to the vagaries of the recording device of the machine as to the differences in the samples tested. So difficult was it to secure satisfactory results from this machine that we long ago discontinued its use, and finally scrapped it. In the absence of more reliable data, however, these results on shock toughness are included in this article for what they are worth.

Curiously enough, the Fremont machine itself, or rather the falling hammer of the machine, gave a striking confirmation of the shock resisting qualities of the special steel it was testing. When the machine was

Table 5-A—Extension, Per Cent—Special Steel—Quenched and Drawn

Extension, Per Cent	No. Tests: 1st 9 Mo.	2nd Yr.	3rd Yr.	4th and 5th Yrs.	Total	Per Cent of Total Tests
10—15	0	2	0	0	2	0.13
15—20	2	0	1	1	4	0.27
20—25	31	152	28	11	222	14.92
25—30	280	606	123	19	1,028	69.08
30—35	160	61	5	2	228	15.32
35—40	0	3	0	0	3	0.21
40—45	0	1	0	0	1	0.07
Total	473	825	157	33	1,488	100.00

Table 5-B—Extension, Per Cent—Ordinary Steel—Air Cooled and Drawn

Extension Per Cent	No. Tests	Per Cent of Total Tests
0—5	2	0.59
5—10	8	2.38
10—15	36	10.68
15—20	121	35.90
20—25	155	46.00
25—30	14	4.15
30—35	1	0.30
Total	337	100.00

Table 6-A—Reduction of Area—Special Steel—Quenched and Drawn

Red. of Area, Per Cent	No. Tests 1st 9 Mo.	2nd Yr.	3rd Yr.	4th and 5th Yrs.	Total	Per Cent of Total Tests
15—20	0	1	0	0	1	0.06
20—25	0	0	0	0	0	...
25—30	2	0	0	0	2	0.13
30—35	10	2	0	1	13	0.85
35—40	13	7	2	2	24	1.60
40—45	13	23	10	1	47	3.14
45—50	45	77	29	6	157	10.55
50—55	86	260	62	10	418	28.16
55—60	211	355	52	13	631	42.38
60—65	93	98	2	0	193	13.00
65—70	0	2	0	0	2	0.13
Total	473	825	157	33	1,488	100.00

Table 8-A—Shock Toughness—Special Steel—Quenched and Drawn

KGM	No. Tests 1st 9 Mo.	2nd Yr.	3rd Yr.	4th and 5th Yrs.	Total	Per Cent of Total Tests
0—5	0	14	2	0	16	1.09
5—10	6	108	21	2	137	9.29
10—15	98	281	46	4	429	29.10
15—20	71	154	32	6	263	17.84
20—25	61	166	34	9	270	18.32
25—30	79	64	16	10	169	11.46
30—35	146	26	4	1	177	12.02
35—40	12	1	0	0	13	0.88
Total	473	814	155	32	1,474	100.00

Table 6-B—Reduction of Area—Ordinary Steel—Air Cooled and Drawn

Red. of Area, Per Cent	No. Tests	Per Cent of Total Tests
0—5	1	0.30
5—10	10	2.96
10—15	23	6.82
15—20	111	32.93
20—25	97	28.78
25—30	71	21.06
30—35	15	4.45
35—40	4	1.20
40—45	4	1.20
45—50	1	0.30
Total	337	100.00

Table 8-B—Shock Toughness—Ordinary Steel—Air Cooled and Drawn

KGM	No. Tests	Per Cent of Total Tests
0—5	101	29.9
5—10	223	66.2
10—15	12	3.6
15—20	1	0.3
Total	337	100.00

received, the hammer was of cast iron, which snapped in two during the calibration of the machine. Ordinary 0.30-per cent carbon cast steel was then tried, and failed in a few weeks. A hammer of the 0.50-per cent carbon steel shown in the tables did better, lasting for some months before it snapped in two. Two hammers of the special steel were then made up and heat treated, with the idea that when one broke the other could be installed at once, but the spare was never needed, and was finally scrapped when the machine was discarded, along with the hammer that had made some 3000 or more tests without sign of failure.

In an article[1] by Dr. Langenberg some figures are given showing the exceedingly high shock toughness obtained on Charpy tests cut from castings made of this special steel and furnished for ordnance purposes during the war. These figures, which speak for themselves, are shown in Table 15; the heat-treated special cast steels give Charpy values somewhat higher than those obtained from 0.32 per cent carbon forged steel, oil quenched and drawn, as quoted in the same article. Table 9 is included to show that the high tensile

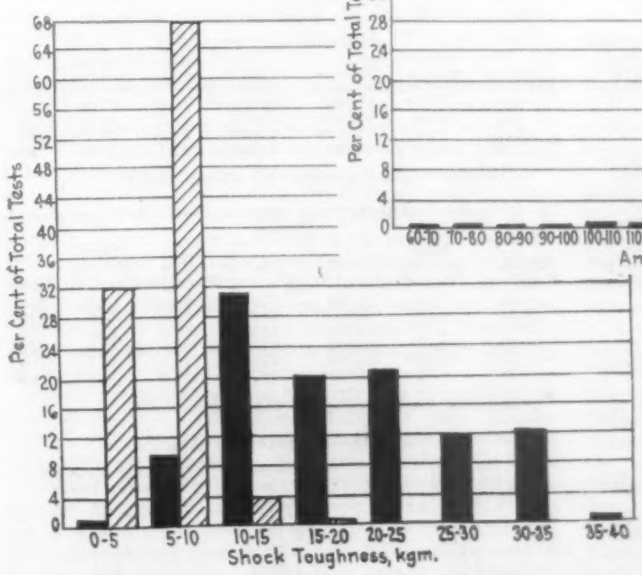
[1] "Impact Tests on Cast Steel"—F. C. Langenberg, *Proceedings* A. S. T. M., Vol XXI (1921) page 840.

Table 7—Bend—½ In. x 1 In. Bar—Special Steel—Quenched and Drawn

Angle of Bend, Degrees	No. Tests 1st 9 Mo.	2nd Yr.	3rd Yr.	4th and 5th Yrs.	Total	Per Cent of Total Tests
60—70	0	1	0	0	1	0.07
70—80	0	3	0	0	3	0.22
80—90	0	1	0	1	2	0.15
90—100	0	3	0	0	3	0.22
100—110	4	0	2	0	6	0.44
110—120	4	1	1	0	6	0.44
120—130	10	3	0	0	13	0.94
130—140	5	6	0	1	12	0.87
140—150	8	8	2	0	18	1.32
150—160	10	10	0	1	21	1.50
160—170	4	3	1	0	8	0.58
170—180	0	5	0	1	6	0.44
180—B	21	30	8	1	60	4.36
180—BOF	91	129	20	6	246	17.89
180—COF	74	211	34	7	326	23.70
180—Flat	237	334	61	12	644	46.80
Total	468	748	129	30	1,375	100.00

B—Broke.
BOF—Broke on flattening the bend.
COF—Cracked on flattening the bend.
Flat—Flat on itself.

Fig. 7—Percentage of Total Tests of the Special Manganese Steel on Bending Bars, 1 In. by ½ In. on 1-In. Pin (at Right)



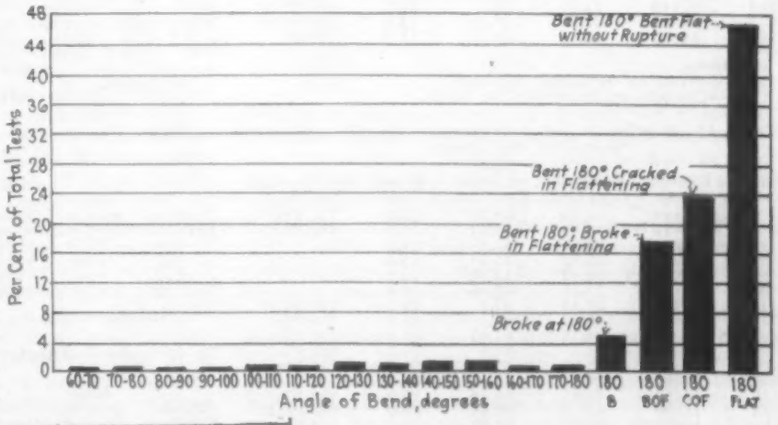

Bent 180° Bent Flat without Rupture
Bent 180° Cracked in Flattening
Bent 180° Broke in Flattening
Broke at 180°
Per Cent of Total Tests
60-70 70-80 80-90 90-100 100-110 110-120 120-130 130-140 140-150 150-160 160-170 170-180 180 B 180 BOF 180 COF 180 FLAT
Angle of Bend, degrees

Fig. 8—Results of Shock Toughness Tests on the Fremont Machine of the Special Manganese and the Plain Carbon Steels Showing the Percentage of the Total Tests at Different Ranges

strength tests of Table 3A and Fig. 3 are not necessarily identical with the tests of Tables 5A and 6A and Figs. 5 and 6 showing comparatively low extension and reduction of area. In Table 11 are given some of the tests where a low tensile strength and elastic limit were obtained; in Table 10 are some of the tests with low reduction of area and normal strength and elastic limit; in Table 12 (and also in Table 11) are some tests that gave an extension of over 32 per cent, and in Table 13 are tests on steel with manganese over 1.40 per cent.

In connection with this latter table, reference should be made to the conclusion of Dr. Langenberg in the article referred to above, that the shock toughness falls off markedly when the manganese exceeds 1.31 per cent or the carbon 0.30 per cent. Our own tests, some of which are shown in Table 13, and which have covered a considerable number of heats, do not bear out this conclusion; we have repeatedly obtained very high shock test results on steel with manganese much above 1.30 per cent. A more extensive series of tests might modify Dr. Langenberg's opinion on this point.

These results are offered to the public in the hope of counteracting as far as possible the still widespread opinion that manganese in cast steel should not be allowed to exceed 0.80 per cent, an opinion held even today by enough engineers to secure the adoption of a clause in one of the specifications of the American Society for Testing Materials forbidding the use of steel castings containing manganese in excess of that figure. The conclusion is also quite obvious that recourse to expensive alloys to secure strength and toughness is frequently quite unnecessary, when manganese alone will usually give as good or even better results. Finally, attention should be called to a widespread practice, in attempts to promote the use of some new steel-making alloy that is claimed to increase the strength of steel without loss of toughness; the practice of actually securing the greater part of the improvement attributed to a trifling addition of the alloy, by running up the manganese content of the steel to 1.00 per cent or thereabout, and comparing this "alloy" steel with a plain steel of similar carbon content, but containing some 0.40 to 0.50 per cent less manganese. Truly, manganese is the Cinderella of the metallurgical world, doing far more than its share of the real work without credit or fame, while its less efficient sisters stand in the limelight and take all the applause.

Table 9—Representative High Tensiles—Special Steel—Quenched and Drawn

Tensile Strength	Elastic Limit	Extension, Per Cent	Red. of Area, Per Cent	Shock Test	Bend ½ In. x 1 In. Bar
101700	72310	21.64	45.95	23.0	90°
98350	70610	23.05	47.30	10.5	180 BOF
93900	66460	22.80	52.75	...	180 BOF
99200	67000	22.80	51.25	10.5	180 BOF
97050	67200	22.65	49.20	19.0	160°
97900	67180	22.80	54.85	7.0	180 BOF
94900	67330	24.66	54.55	11.0	180 BOF
94900	65600	21.14	52.95	5.0	180 Flat
104000	76500	21.04	51.9	22.0	155°
97300	65000	21.94	46.2	6.0	150°
98700	67830	22.59	48.10	25.0	180 COF

BOF—Broke on flattening the bend.
COF—Cracked on flattening the bend.
Flat—Flat on itself.

Table 10—Representative Low Reductions of Area—Special Steel—Quenched and Drawn

Tensile Strength	Elastic Limit	Extension, Per Cent	Red. of Area, Per Cent	Shock Test	Bend ½ In. x 1 In. Bar
95550	54720	24.4	35.56	15.0	110
88500	52180	25.74	34.05	22.0	180 BOF
87200	50640	26.09	35.60	13.0	150
89450	53200	24.61	32.79	26.0	180 BOF
91300	51750	23.05	33.50	19.5	125
88200	52400	23.90	35.0	22.0	180 BOF
86800	52390	23.45	33.8	15.5	180 BOF
85000	51720	24.76	32.62	10.0	180 BOF
86200	53200	31.40	39.84	22.0	180 B
93200	55600	25.57	32.9	20.0	180 COF
91750	55750	22.54	34.1	28.5	180 COF
90900	55600	26.19	39.57	28.5	165
85500	51040	25.06	33.48	15.0	125
90500	53810	19.85	25.91	17.5	150
90200	53440	21.29	34.7	32.5	180 COF
87000	56600	23.95	38.5	32.0	180 BOF
89200	54450	22.14	36.11	11.0	180 B

B—Broke.
BOF—Broke on flattening the bend.
COF—Cracked on flattening the bend.

Table 11—Representative Low Tensile—Special Steel—Quenched and Drawn

Tensile Strength	Elastic Limit	Extension, Per Cent	Red. of Area, Per Cent	Shock Test	Bend ½ In. x 1 In. Bar
68470	46400	33.18	59.78	36.5	180 Flat
67580	46610	29.49	59.61	29.5	180 Flat
71900	41300	29.84	55.2	34.5	.....
73400	45990	25.62	45.18	20.0	.....
68400	43620	33.49	53.40	32.5	.....
68900	42150	31.25	62.40	30.0	.....
74450	44440	28.46	47.3	29.5	180 BOF
72310	49600	28.93	62.7	32.0	180 Flat
68700	45990	31.15	61.55	31.5	180 Flat
71000	43200	31.5	62.0	30.5	180 Flat
73200	47420	32.97	61.8	29.5	180 Flat
70550	47880	30.24	53.5	31.0	180 Flat
70610	46200	34.35	59.74	26.0	180 Flat
73800	48500	33.54	62.66	29.0	180 Flat
72760	46400	32.05	57.66	29.0	180 Flat

BOF—Broke on flattening the bend.
Flat—Flat on itself.

Table 12—Representative High Elongations—Special Steel—Quenched and Drawn

Tensile Strength	Elastic Limit	Extension, Per Cent	Red. of Area, Per Cent	Shock Test	Bend ½ In. x 1 In. Bar
80400	54300	32.61	60.05	17.0	180 Flat
83500	56300	37.7	53.6	14.0	.....
84900	54900	34.3	49.2	16.5	180 Flat
87450	58150	38.05	58.8	14.0	180 COF
86300	60600	34.25	43.4	15.0	.....
79960	50650	41.15	61.0	21.0	180 Flat
81000	50020	32.35	52.8	19.0	180 Flat

COF—Cracked on flattening the bend.
Flat—Flat on itself.

Table 13—Tests With Very High Manganese—Special Steel—Quenched and Drawn

Carbon, Per Cent	Manganese, Per Cent	Tensile Strength	Elastic Limit	Extension, Per Cent	Red. of Area, Per Cent	Shock Test	*Bend
0.28	1.40	83000	52990	29.59	57.9	27.5	105
0.31	1.40	84240	55300	28.21	52.0	22.0	180 Flat
0.23	1.41	94900	65600	21.14	52.95	5.0	180 Flat
0.24	1.41	90200	55600	24.66	48.95	12.5	180 BOF
0.28	1.41	92550	54650	26.09	53.25	19.0	180 Flat
0.22	1.42	79400	46800	28.62	46.2	5.5	180 COF
0.22	1.42	87300	57800	28.88	46.75	10.0	180 Flat
0.27	1.42	90700	63800	21.54	36.11	20.0	.....
0.25	1.43	86600	49190	24.0	56.75	11.0	180 Flat
0.25	1.43	92200	61850	24.15	53.2	30.0	180 Flat
0.25	1.44	94750	65830	23.35	47.6	10.5	135
0.26	1.44	91300	61400	24.05	46.2	...	180 BOF
0.27	1.44	85100	55970	25.57	52.55	10.5	.....
0.27	1.44	84900	57000	26.40	50.7	32.0	70
0.28	1.45	88700	52150	27.05	58.2	26.0	180 BOF
0.25	1.46	91750	57000	25.57	46.75	16.0	180 B
0.25	1.46	94500	53870	23.3	37.35	9.0	150
0.23	1.47	92300	60970	26.75	53.10	5.0	180 COF
0.26	1.47	94950	60000	24.91	47.3	15.0	85
0.25	1.48	90700	65930	25.93	51.7	17.0	.....
0.25	1.48	89100	59620	28.36	51.1	14.0	.....
0.28	1.50	94000	65280	28.77	52.3	15.0	.....
0.23	1.54	94250	51470	23.35	52.0	17.0	180 BOF
0.23	1.54	90700	62780	27.2	56.6	25.5	180 Flat
0.23	1.54	90450	59830	29.24	59.55	22.5	180 Flat
0.34	1.54	99000	63900	25.21	41.0	10.0	180 BOF
0.22	1.75	98500	57200	25.73	47.5	10.0	150

B—Broke.
BOF—Broke on flattening the bend.
COF—Cracked on flattening the bend.
Flat—Flat on itself.

Table 14-A—Recent Tests of Special Steel—Water Quenched and Drawn

Carbon, Per Cent	Manganese, Per Cent	Tensile Strength	Elastic Limit	Extension, Per Cent	Red. of Area, Per Cent	Bend
0.28	1.39*	88250	66750	26.0	52.2	180
0.32	1.41	102500	61400	23.5	48.5	180
0.32	1.41	103000	62000	24.0	48.9	180
0.22	1.73	99000	64250	27.5	50.6	180

*Identical heats—compare the elastic limits.

Table 14-B—Recent Tests of Special Steel—Air Cooled and Drawn

Carbon, Per Cent	Manganese, Per Cent	Tensile Strength	Elastic Limit	Extension, Per Cent	Red. of Area, Per Cent	Bend
0.24	1.30	83250	47000	28.5	44.9	180
0.27	1.30	82500	48250	27.5	48.6	180
0.27	1.31	87250	48500	27.0	47.8	180
0.28	1.33	88000	54500	26.0	42.8	180
0.28	1.39*	80000	47250	28.5	50.9	180
0.28	1.63	84000	46750	27.0	52.0	180

*Identical heats—compare the elastic limits.

Table 15—Langenberg's Results

Carbon, Per Cent	Manganese, Per Cent	Average Foot Lb. Charpy Tests
0.44	0.93	10.01
0.27	1.08	31.58
0.298	1.31	32.24
0.222	1.29	27.87
0.33	1.54	8.49
0.346	1.76	6.75

While the American Rolling Mill Co. Emphasizes the Importance of the Ounce of Prevention, It Does Not Overlook the Pound of Cure. Here is a first-aid class being shown how to bandage an injury

Selling Safety to the Worker

How the American Rolling Mill Co. Has Cut Accident Frequency to About One-Fourth the Average for the Steel Industry

BY BURNHAM FINNEY

SHOULD an open-hearth melter eat roast pork before being on an eight-hour shift of duty?

At first glance, such a question might seem to be one of concern to the melter and his family alone; certainly if a man's home is his castle, his table should be beyond public scrutiny! But a little consideration will reveal a point of legitimate interest to his employer and his fellow-workers. A heavy meal of roast pork, plus a hearty eater, plus eight hours of strenuous labor exposed to heat may very well equal a bad case of cramps or other digestive disturbances so severe as to cause real pain and possible permanent injury to the trencherman in question.

This is one of the things the safety organization at the American Rolling Mill Co. discovered when studying the possibility of reducing plant accidents. No restrictions are made of course—a man may eat whatever he desires. But the safety department got busy and secured competent advice on the matter of foods for heavy workers; had the resulting diets printed and distributed among the various employees and has materially added to the comfort, not to say productivity, of the men. The medical department went further. It prepared a list of diets for those suffering from various minor ailments; these were printed on large placards under the title "Food for Thought" and given to all who desired them. The demand was astonishingly large. The bulletins were taken home and doubtless served as a practical guide for many a housewife who formerly had no great understanding of dietetic principles.

This is merely one sidelight on the unusual work toward accident prevention which has been quietly going on at the plants of this company in Middletown, Zanesville and Columbus, Ohio, and Ashland, Ky. The smoothly working safety organization has kept the employees continually on the *qui vive* by novel and dramatic appeals for greater caution and watchfulness. That the methods have been successful is shown tersely in the accompanying table, which shows the accident frequency at the Middletown works. (Accident frequency is defined as "the number of major accidents per million man-hours.")

Accident Frequency at Middletown Works of American Rolling Mill Co.

Year	Total Number Major Accidents	Number Major Accidents per Million Man-Hours
1918	397	34.7
1919	142	15.9
1920	111	10.6
1921	65	8.6
1922	111	12.7
1923	113	12.0
1924	89	10.5

Special emphasis was placed upon the strict interpretation of what constituted a major accident. It was termed "any accident causing a man to be incapacitated for his regular work for more than the remainder of the day, turn, or shift on which the injury was received, including any case resulting in death within two years of the date of the accident. Also, compensation cases in which the injured man loses no time from work."

Nor are the figures juggled to permit a good showing, a practice which is, unfortunately, too prevalent. Men used to be placed on light work, sorting scrap or piling material with one hand only, in order to avoid having them appear on the accident record. This can no longer be done at the American Rolling Mill Co. because of strict definition of what causes an accident.

Foremen and their superiors are held responsible for the prevention of accidents. They are accountable for safe practices just as they are for tonnage and quality of production. It is the function of the full-time safety department, headed by a supervisor of safety, to stimulate and direct the safety activities of the operating organization. Each of the company's works at Middletown, Zanesville, Columbus and Ashland, has a full time safety advisor, while another member of the safety department directs the first aid training of all the plants.

Two central safety committees meet regularly with

the safety department and through it confer with the management on important safety policies. These committees, composed of the chief operating superintendents, are known as the Middletown division central safety committee and the Ashland division central

This Dipper in the Galvanizing Department Can Produce More Because He Does Not Fear Burns While He Is Wearing the Special Safeguards Developed by the Safety Organization

safety committee. The former represents the Middletown, Zanesville and Columbus works, and the latter the Ashland works and the company mines.

The central committees reach individual workers through departmental safety committees, appointed by the superintendent. Membership changes frequently, as the average term of service is six months. The most important function of the committees is to inspect the departments at least once a month to see that every precutionary measure is being taken to protect the workmen and that all tools and machinery are in proper condition.

The prevention of many accidents is attributed to the cooperation between the safety, medical and employment departments. The men as well as the plant must be physically sound. Each applicant for a position is subjected to a rigorous physical examination. If the men pass the test and are employed, they are urged to take advantage of the opportunity to consult the medical department at any time. Accordingly, thousands of workmen voluntarily visit the medical department each year to be examined or to alleviate some ailment.

On some jobs the employees are compelled to use protectors to shield them from accidents. Articles of safety wearing apparel are given to employees by the company, and they are practically obliged to use them. For example, goggles and specially designed aprons are supplied to the men in the open-hearth department. Arm protectors are used by the men handling steel sheets, thus eliminating most of the accidents resulting from bad cuts on the wrists and arms.

The result of the policy of equipping the men with protective devices is well illustrated in the case of goggles. By their use four thousand men at the Middletown plants have worked for over five years without the loss of an eye.

These safety devices in no way interfere with plant operations. A guard must be efficacious in precluding accidents, but it must not handicap production. Investigation reveals that safety guards have increased the output per man—an increase due principally to the greater confidence instilled in the men by the knowledge that they are unlikely to be hurt.

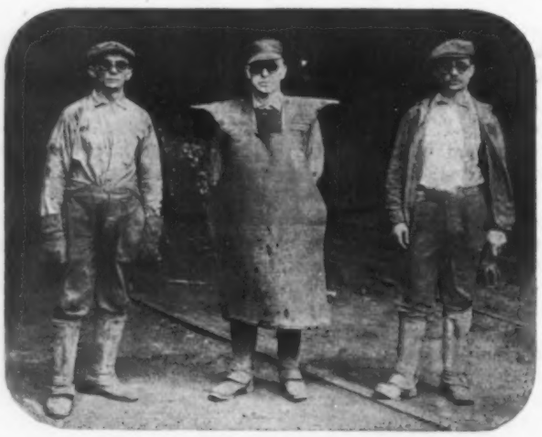
Accidents in connection with the operation of cranes formerly constituted one of the most serious problems. Examination of the eyes of crane operators proved that many had defective vision, despite the fact that they were engaged in a task that required perfect eyesight. Today the men chosen for this duty not only fulfill rigid requirements regarding their vision, but also are of the conservative, middle-aged type who can be relied upon for steadiness and caution. Operating a crane seems to have a fascination for young men, who are often reckless and who have not been imbued with the cautious spirit of the older person. But the former are no longer selected.

Judicial use is made of records and statistics. When they are placed before the worker they are put in an attractive form that will engage his attention. At the entrance to each plant is a bulletin board on which every major accident is posted. The following, dated July 24, 1925, is a typical sample:

"A take-off man at the jobbing mill shipping re-square shears received a severe cut on his right forearm. He was loading sheared iron onto a truck when a piece slipped and struck his arm. Wristlets would have prevented this accident. All men working around the shears should protect themselves by securing a pair of wristlets from the foreman."

Such a bulletin teaches a powerful safety lesson. Its force is derived from the fact that its premise is not mere theory, but an actual accident. The crowds of workmen who gather about the board whenever a new bulletin appears are ample testimony to its worth.

The manager of each plant promotes monthly local contests as an additional incentive to every man to work more safely. Each month is devoted to a special subject. Among the topics receiving attention are "First Aid and Health," "Personal Safety Devices," "New Employees," "Unsafe Practices," "Unsafe Equipment," "Natural Operating Hazards," "Fire and Gas Hazards,' and "Health."



Leggings and Goggles, Special Shields and Heavy Boots. . . . These form the armor which protect workers against that ancient enemy, Old Man Accident

Introducing the new employee to his job so that he masters its intricacies without danger of injury was a topic recently stressed. Instead of permitting the inexperienced hand to learn his various duties as best he could, foremen were urged to lend their assistance by giving him special attention and by getting the new man acquainted with his co-workers who would help him.

Numerous novel stunts are employed in the course of safety campaigns. One which caused much comment

(*Concluded on page* 936)

Modern Steel Plant in Alabama

Open-Hearth Furnaces of the United States Steel Corporation's Works at Fairfield Have Unusual Arrangement of Regenerator Chambers

AN installation of four 125-ton stationary open-hearth furnaces, the first unit of an ultimate twelve-furnace plant, was recently put in operation at the Fairfield works of the Tennessee Coal, Iron & Railroad Co., at Fairfield, Ala., in the Birmingham district. The large demand for steel at the Fairfield works has outgrown the steel making capacity of the Ensley duplexing plant, which has been making steel for both the Ensley and Fairfield works.

These furnaces use the pig and scrap process, utilizing the discard and scrap steel from the Fairfield mills. Generous space is provided as indicated by the accompanying illustrations, the building being 450 ft. long with both pouring and charging sides 76 ft. 7 in. center to center of columns and with a 37-ft. lean-to on the charging side, to house the waste-heat boilers.

On the pouring side of the building on a level with the cage floor of the 200-ton ladle crane is an escape platform the full length of the building by which the operator can quickly gain the outside of the building through a series of doors and get the metal sheeting of the side of the building between him and the point of danger.

The pouring side is served by a 200-ton 67-ft. span ladle crane with 40 and 15-ton auxiliaries, while the charging floor is served by a 125-ton, 67-ft. ladle crane with a 40-ton auxiliary and by a 12-ton low-type charging machine. Each furnace has a 6-ton jib crane for spout handling, etc.

The charging side building extends 50 ft. beyond the floor to enable the 125-ton crane to pick up the 70-ton hot metal ladles coming from the blast furnaces and charge them directly into the open-hearth furnaces. This 50-ft. bay will ultimately be a part of the mixer building.

The furnaces are built to use either tar or by-product gas, or both fuels at the same time. Oil can be used instead of tar by a slight change in the burner orifice, if desired. The furnaces have hearths 15 ft. 3 in. by 48 ft. and are 18 ft. 3 in. by 76 ft. 6 in. outside of brickwork. The binders are of heavy steel construction with 6½ x 15 in. slab buck-stays which are water-cooled.

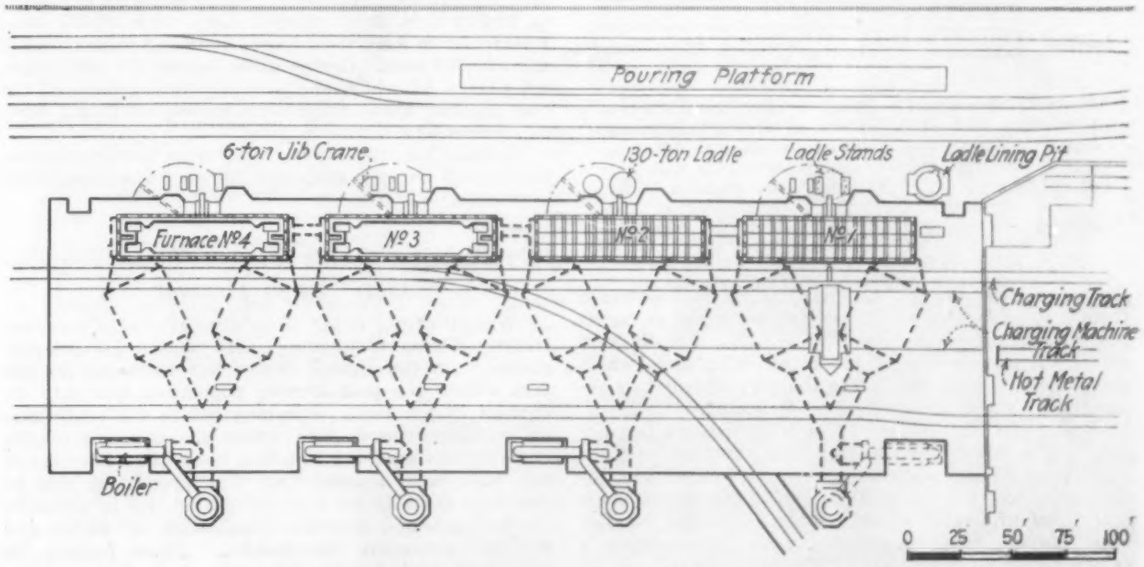
Slag line coolers are provided on both front and back walls. Each furnace is provided with five water-cooled doors and frames. The doors are operated by five 2-ton electric hoists suspended between struts high above the furnaces and operated by push buttons at the floor, the control for two furnaces being grouped together. The furnace roof is 13½ in. thick with 18-in. ribs throughout. The slag pockets are large with air-cooled bottoms.

The tar and coke oven gas burners are combined in one water-cooled unit, and both tar and gas are reversed by two steam cylinders, one at each end of the furnace, and operated by two 3-way valves. By means of bent slotted levers the atomizing steam is turned on just before the tar and turned off just after the tar is shut off. The complete fuel reversal system is above the charging floor.

The tar system consists of a 250,000-gal. storage tank and two 10,000-gal. tar treating tanks. The tar is pumped directly from the adjacent by-product coke plant to these tanks. From the treating tanks it is pumped to the open-hearth furnaces, through 4-in. pipes with 2-in. return pipe. A 2-in. steam pipe serving both to maintain the temperature of the tar in the lines and to atomize it at the burners is adjacent to the supply and return tar line. The entire tar system is arranged with the minimum amount of dead line during reversals and shut-downs. Room is allowed for later installation of gas producers should the tar supply be utilized elsewhere in the future.

An interesting feature of this open-hearth plant is the arrangement of regenerator chambers, which are built on converging angles so that the regenerators and stack flues form a Y, thus giving the most direct route to the stack. The regenerator chambers are steel lined and insulated.

The stacks are of radial brick type, 7 ft. inside and 200 ft. high, with waste-heat boiler connection. Three furnaces are equipped with heavy marine type, single-pass, horizontal, fire tube boilers of about 500 rated horsepower. Provision is also made for placing similar shells above the present shells, thus making a double pass boiler. The boilers are equipped with supplemen-



The Regenerator Chambers of the Open-Hearth Furnaces Are Built on Converging Angles, Giving Direct Connection with the Chimneys. Waste-heat boilers are provided, of the marine fire-tube type

tary burners, using by-product gas, superheaters, feed water regulators, steam turbine driven induced draft fan and safety devices. The boilers are built for 250 lb. pressure, 150 deg. Fahr. superheat.

The flue valve and air reversal arrangement consists of two air valves, two regenerator flue dampers, one stack damper and one waste heat boiler flue damper. All dampers and frames are water-cooled. The air valves and regenerator flue dampers are operated simultaneously by a 15-hp. motor, while the stack and waste-heat boiler dampers are operated by a hand winch. The air valves are regulated by floor stands.

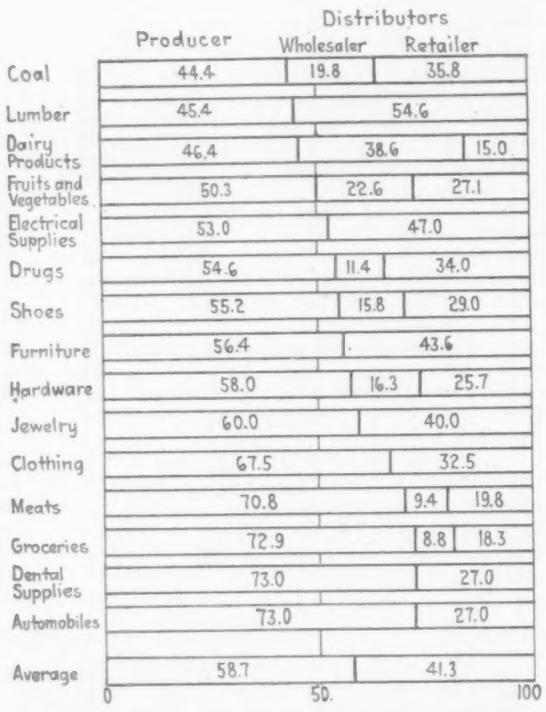
The scrap storage runway is 81 x 400 ft. and is served by two 15-ton magnet cranes. Paralleling and built in connection with the scrap storage is a steel trestle and elevated bin system for ore and limestone storage, the material being drawn from the bins into charging pans on cars located on tracks directly beneath the bins.

The plant is provided with tail trestle, refractory plant, mold yard, drinking water system, sewers, sanitary system, bath house and offices of latest approved type. The capacity of the plant is about 25,000 tons per month.

COST OF DISTRIBUTION

Producer Gets 58.7c. and Distributors 41.3c. of the Consumer's Dollar—15 Lines Analyzed

A comprehensive analysis of the cost of merchandise distribution, rates of merchandise turnover and fluctuations in manufacturing employment in the United States has been made by Niles & Niles, certified public accountants, New York. This is published in a copyrighted review, the information having been obtained from a wide variety of sources and covering, so far as possible, the situation from 1913 to 1923. The diagram shows the proportions of the retail sales price which go to the producer and to the chain of distributors respectively, in the 15 leading lines indicated.



How the Consumer's Dollar Is Divided Between Producers and Distributors in Fifteen Leading Lines. Where no division is shown between wholesaler and retailer the information was not complete or one of the two was missing. The figures represent cents and each line is the average for a considerable number of separate establishments

Some of these classes of merchandise go through only the retailer after leaving the producer. Others go through jobbers and wholesalers, with consequent increase in cost of distribution. Of those which show both, the wholesale absorbs 17.8c. and the retailer 25.6c., to the producer's 56.6c., from the consumer's dollar.

Evidently the average rate of turnover exercises a large influence on this cost. Over five of the lines which represent most frequent purchases, the producer's turnover works out at 3.1 times per year, the wholesaler's at 4.1, and the retailer's at 3.8, making a combined rate of 1.3 for the group. This is shown in the table:

	Producer	Wholesaler	Retailer	Combined
Clothing	2.8	..	4.5	1.7
Drugs	2.3	3.6	2.3	0.9
Groceries	4.6	5.6	8.3	1.9
Hardware	2.8	3.6	2.1	0.9
Shoes	3.2	3.7	1.9	0.9
Average of 5 classes	3.1	4.1	3.8	1.3

Evidently a reduction of the average inventory, operating to increase the rate of turnover, will bring about a reduction in the cost of distribution. Similarly a more nearly uniform rate of production, to minimize fluctuation in employment and reduce inefficiency and expense incident thereto, will reduce the cost of production. Either of these results, without reducing the profits of producer, wholesaler or retailer, will give greater purchasing power to the consumer's dollar.

It follows, then, that the purchasing power of this dollar is affected not only by cost of production, to reduce which inventive skill and operating experience have been employed for many years, but also by cost of distribution, which it appears may be similarly reduced by a corresponding study of the underlying conditions.

Malleable Castings Show Decline in August

WASHINGTON, Sept. 28.—Showing a slight decrease, production of malleable castings reported by 142 plants (of which five were idle) to the Bureau of Census totaled 56,829 tons in August, against 57,229 tons in July, also for 142 plants of which four were idle. The capacity operated in August was 49.6 per cent of the monthly capacity of 114,455 tons. Shipments amounted to 52,543 tons and orders booked were 48,691 tons. Shipments in July were 54,863 tons and orders booked were 56,933 tons. Comparative figures for 130 identical plants, of which one was idle during each of the two months, show August production of 53,221 tons, as against 53,450 tons in July.

August has the lowest total since last November, but it is 55 per cent above the figures for August, 1924.

"Production Gains Faster Than Population" Says Hoover

WASHINGTON, Sept. 29.—Secretary of Commerce Herbert Hoover today stated that while industrial productivity in the United States has increased 30 per cent within the past decade, population has only increased 15 per cent. Speaking before the conference on grinding wheels held under the auspices of the Division of Simplified Practice, he pointed out that it has thus been demonstrated that production can be increased much faster than population, due to advances in the arts and sciences, elimination of waste and adequate statistical information. These factors, he said, have made the present economic condition of the country the most satisfactory which it has ever experienced.

Open-Side Planer with New Features

Rigid Construction Provided, and Convenience Secured by Simplifying Locking and Unlocking of Rail, Setting Feed and Other Operations

ONE of the new machine tools that attracted considerable attention at the Steel and Machine Tool Exposition held in the Public Auditorium, Cleveland, Sept. 14-18, was the open-side planer illustrated, which is a recent addition to the line of the G. A. Gray Co., Cincinnati. The machine is built in four sizes, 36, 42, 48 and 60 in., the smallest size, 36 in. by 10 ft., being in operation at the exposition.

In recognition of the fact that planers of this type are often used for heavy work and are therefore under heavy cutting strains, a departure has been made from the usual design of column and knee. The rigid proportioning of those parts is indicated by the fact that a 36-in. planer of this type has taken 1-in. cuts with 3/16-in. feed in forged steel.

Being subjected to severe twisting strains, the column has been made triangular in section, which design is claimed to be stiffer than the usual column of rectangular section because its walls are directly in line with the forces to be resisted, and there can be no yielding at the corners. The column face is wide to provide adequate support for the side head, even when long-reach tools are used. Heavy internal braces cast integral with the column add to its rigidity.

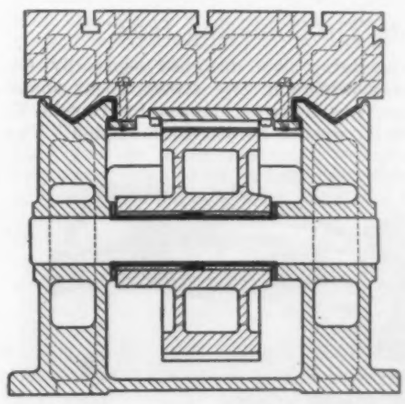
The bed of the machine has four vertical walls, is cast solid across the bottom, under the gears, and has a heavy brace across the top, directly under the cutting tools and the rail. This is claimed to provide an unusually rigid structure, eliminating vibration at a most important point. The remainder of the bed is cast solid on top. The bed is planed on the bottom to facilitate leveling and to relieve internal strains in the casting. The heavy outer wall of the bed extends up the side of the column to the level of the top of the table so as to support the column as high up and as near to the rail as possible. In addition a heavy tongue and groove, planed into column and bed, with a metal-to-metal fit, fasten the column and bed together. No part of the bed or the drive mechanism extends below the floor-line.

The gear train is similar to that of the company's Maximum Service (double-housing) planer described in THE IRON AGE of Dec. 1, 1921. The gears and table rack are cut from steel forgings and are helical throughout, including bull gear and table rack. A feature is the design of the bull gear which offsets the pressure of the tools on the work by exerting a side thrust on the table. The tools are usually fed away from the operator so that he can see the surface resulting from the cut, and the bull gear tends to push the table in the opposite direction. This is said to materially decrease the tendency of the table to lift under a heavy cut. To still further reduce it, the bull gear teeth are designed with a 9-deg. pressure angle, the force exerted being said to be nearly horizontal, eliminating the usual vertical thrust. The tooth form used is also intended to provide maximum action in the arc of recess, rather than in the arc of approach, the teeth being of true involute form with long addendum pinions. It is claimed that the continuous rolling contact obtained is of importance not only in getting fine finishing cuts but that it assures also steady flow of power for the heavy roughing cuts. The gear train runs in a bath of filtered oil, and the side thrust bearings of bronze provided on each shaft run in a flood of oil which flows over them from the bearings.

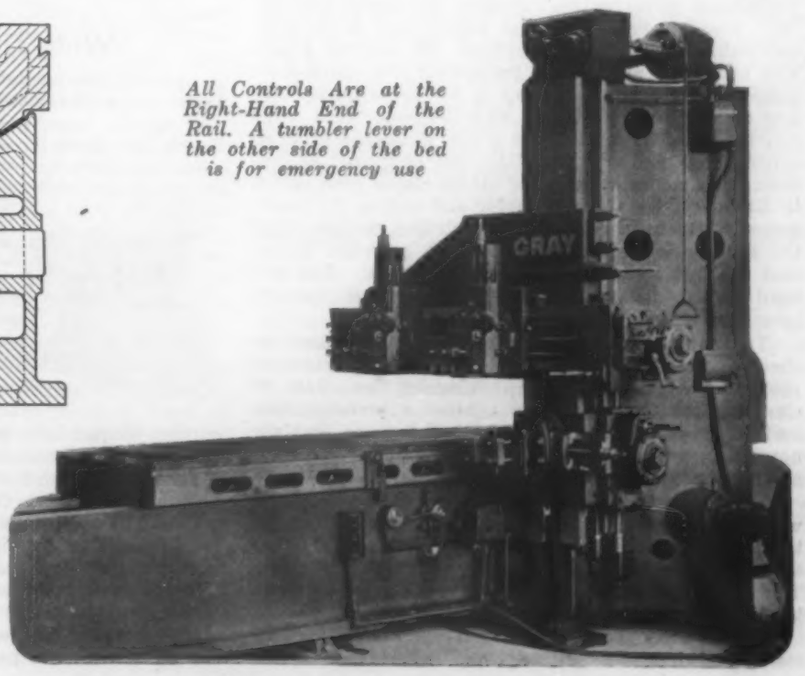
Hold-Down Gibs Extend Length of Bed and Table

To meet the necessity of planing overhanging castings of awkward proportions, hold-down gibs have been provided not only at the center of stroke, but over the entire length of bed and table. Thus tilting is prevented in any position of the table. The oil pumped to each vee flows over the hold-down gibs, so that they run in a flood of oil, which is regarded as a precaution of practical value inasmuch as the upward pressure on the gib may at times be almost as great as the downward pressure normally exerted on the vees. In removing the table, the gibs may be disengaged from the table without running it off the bull gear. Automatically oiled side thrust bearings are also provided between table and bed.

The structure of the rail and the knee which supports it is unusual. The knee is a pyramid of cast



In the Cross Section of Bed and Table Shown Above, the Heavy Black Lines Indicate the Parts Provided with Forced Feed Lubrication



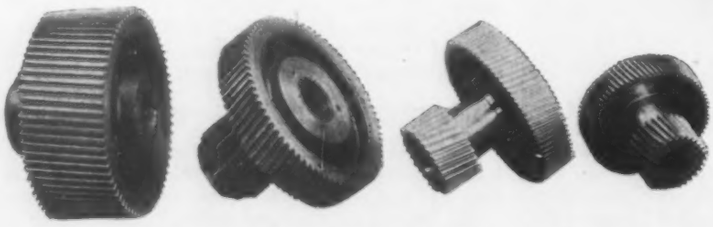
All Controls Are at the Right-Hand End of the Rail. A tumbler lever on the other side of the bed is for emergency use

iron of heavy section. A novel knee-lock which can be applied or released from the usual operating position by the use of a single crank, locks the knee to the inside of the column in four places. The clamping effect is balanced automatically so that one clamp cannot be locked without also locking the others. It is claimed that the great clamping pressure available prevents vibration or shifting between the knee and column, and explains in part the heavy cuts which the planer can take without vibration. The clamping effect is applied not only in the front, but at the rear of the knee as well, and at the upper end lower edges of the knee. Adjustment for wear is automatic.

The rail can be set to any desired position by the use of the rail-setter lever hanging at the operating position. A partial turn of the wrist unlocks this lever, and the direction of travel, up or down, corresponds to the direction in which the lever is moved. Instant stoppage of the rail when the lever is pushed into "off" position permits of setting to a line. This arrangement allows the rail to be set close to the work, tending to eliminate long reaching with the cutting tool, and makes possible heavy cuts free of chatter marks.

Ball-Bearing Spring Counterbalance a New Feature

A new feature on this type of planer is the Gray ball-bearing spring counterbalance. A ball-bearing roller is mounted at the right-hand end of the rail at the top, and heavy springs force this roller against the right-hand edge of the column face, thereby keeping the rail and knee snug against the column even when unclamped. This counterbalance is intended to offset the overhung weight of the knee, relieves the rail-elevating screw of bending strains, eliminate cocking and binding, and thus facilitate raising and lowering of the heavy knee and rail.



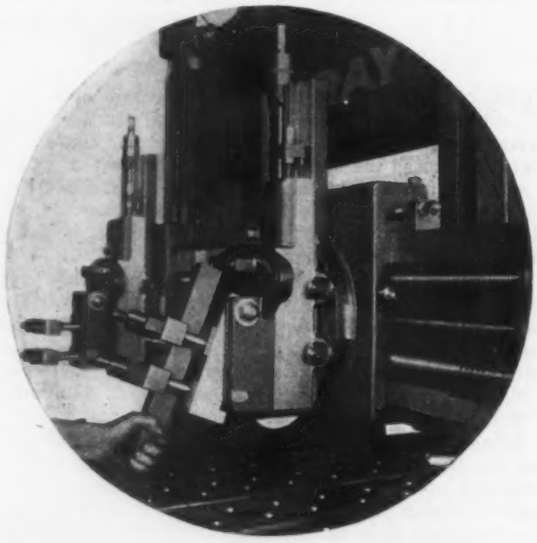
View of Head Showing Abutment Apron and Twin Purpose Taper Gibs Is Above. The gear train is shown at the left

One push to the rapid traverse lever is sufficient to set the head in place. These levers are mounted in the right-hand end of the rail, and by one motion of the lever the motor is started in the right direction, the crank disconnected to avoid accident, and the feed mechanism disconnected. Putting the lever into the "off" position reconnects the power feed to the head automatically and also reconnects the manual crank. This control is stressed as permitting the operator to jump quickly over an air gap in his job without "cutting air" for several strokes with the power feed. One rail head can be moved into place while the other is cutting, and similarly the slides can be moved up and down by rapid traverse. The safety clutch used serves to disconnect the traverse motor and relieve the mechanism of strain in case one head strikes another, or if the slide, in being moved downwards, goes too far, so that the tool strikes the table or the work. The side head is provided with an independent rapid traverse lever and also its own Cantslip feed dial.

Tool aprons are provided with an abutment or shoulder across the lower end, a feature intended to prevent springing of the apron under the strain of clamping the tool. It bears against a corresponding surface on the lower end of the tool box, so that the upward thrust of the cutting tools comes on this abutment rather than on the taper pin.

The table is of box-section, with heavy internal walls, one of which is extended the full length of the table directly under the center Tee-slot, so as to tie top and bottom plates together and prevent springs. The bed is of double length; the table never overhangs.

The Cantslip feed, a feature of the company's previous machines, is positive, not being transmitted through frictions. The dial is self-locking, and is graduated in 0.001 in. A partial turn of the wrist unlocks the dial automatically and permits of setting to any feed between zero and 1 in., in steps of 0.01 in.

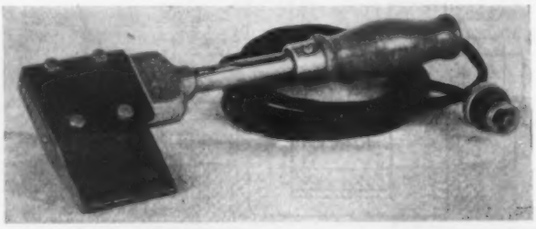


Oiling of the machine has been made as automatic as possible, continuous flow of oil to vees, side thrust bearings, hold-down gibs, gear train and shaft bearings being provided, and also centralized oilers on the rail, rail heads, side head and column. The traverse motor runs on ball bearings in grease and drives gears which run sealed in an oil case, mounted on ball bearings.

The machines can be arranged for self-contained countershaft drive, motor drive with motor mounted directly on the column, or for reversing motor drive. Many of the features outlined above are covered by letters patent and by patent applications.

Wide-Tip Soldering Iron

An electric soldering iron designed especially for heavy work and available in two styles, spear shape and hatchet type, has been announced by Harold E. Trent, 259 North Lawrence Street, Philadelphia. The



hatchet shaped iron, which is here illustrated, is especially suitable for reed work.

The tips are of copper and are interchangeable. They are clamped to the heating unit, which, it is said, can be left on indefinitely at its rated voltage without overheating the tip or burning out the unit. The iron takes 500 watts at 110 volts. The tip is ¼ in. by 3 in. on its working surfaces. The weight complete is 5¼ lb., and the device is proportioned so that it can be easily handled. The equipment includes 10 ft. of flexible cord and a two part plug.

SEMI-AUTOMATIC GRINDER

Work Stopped, Compound Shut Off and Wheel Feed Reversed Automatically at End of each Cut

The type B semi-automatic cylindrical grinding machine recently brought out by the Norton Co., Worcester, and demonstrated at the New Haven machine tool exhibition and the Steel and Machine Tool Exposition at Cleveland, is shown in the accompanying illustrations. The machine is essentially a type BA special purpose grinder, for production purposes but with the important addition of pneumatic and automatic control, and with base and work-carrying parts made heavier in order to provide the greater rigidity required under high production conditions.

The cycle of manufacturing operation is performed automatically, leaving the operator free to prepare work for the machine or to look after a second machine. Another time and labor saving feature is in the removing of work from the centers and replacing it with a new piece, which are facilitated by the pneumatic control of the tail spindle to withdraw or advance the tail center. The valve which controls the air piston is operated by a pedal. This gives the operator the use of both hands in removing the finished piece from the machine and in placing the next piece on the cradle, which is fixed at such a height that when the center moves forward the work is lifted to swing clear.

Cylindrical Grinder With Automatic Features Which Adapt It for Manufacturing Purposes. The rear view above shows the method of mounting the standard motor for the main drive

The two machines of this model which have been built provide 12 in. maximum swing over the swivel table and take 18 in. lengths between centers, but it is contemplated that longer machines of the type will be built later. Wheels 20 in. in diameter and up to 9 in. thick can be mounted, making the machine capable of taking cuts up to 9 in. long. The Norton wheel spindle reciprocating attachment on the end of the wheel spindle, giving the grinding wheel an oscillating motion of ¼ in., is employed in the machine.

The pedal which controls the tailstock spindle may be seen near the floor in the front view illustration. The small cylinder mounted on the ways in front of the wheel controls a pneumatic steady rest. The device has been developed for use in connection with this machine, but is adaptable to other types. The micrometric wheel feed is positively controlled by a cam which permits the wheel slide to move toward the work to a positive stop, and then to reverse automatically to move the wheel back. The automatic cycle is started by the movement of a lever, consists of starting the work revolution, turning on the flow of grinding compound, feeding the wheel toward the work up to the stop, reversing the feed to back the wheel quickly from the work, stopping the work revolution and shutting off the flow of the compound. The rate of infeed, which determines the time required for the cycle, can be varied to suit material to be ground by means of conveniently placed change gears on the front of the machine.

The machine is self-contained, carrying two standard electric motors, which are accessibly mounted. Power for the grinding wheel and wheel feed is supplied by a constant-speed motor bolted to the rear of the base. The work is revolved on dead centers by a headstock mounting an adjustable speed motor.

The wheel slide is of the company's regular type B design, with the improved spindle bearing construction which permits of adjustment while the spindle is running. A reservoir in the wheel slide supplies lubricating oil to the spindle journal and thrust bearings through the impulse of a chain-driven pump. The stream of oil flowing on the bearings is visible to the operator through bull's eye glasses on the front of the wheel slide.

The base is of heavy construction to provide suitable support for the massive wheel spindle-head and heavy-type headstock and footstock. It rests on three points and requires no other foundation than a good floor. The work table is low for the convenience of the operator in handling heavy work. The work revolution is started and stopped automatically by the action of a cone clutch and brake, thus avoiding the necessity of starting and stopping the motor. Grinding compound is supplied to the wheel by a pump mounted on the main drive shaft. A pump tank and settling tank of large capacity are located at the rear of the machine.

Automatic Magazine Feed for Inclinable Presses

An automatic magazine feed for presses which are fed in an inclined position, and which is claimed to eliminate the hazards connected with hand feeding of forming die work, has been added to the line of the F. J. Littell Machine Co., 4125 Ravenswood Avenue, Chicago. Material increase of production is also claimed, due to the feed catching every stroke of the press. The feed can be operated at the rate of 70 to 75 pieces per min., at which rate the capacity for a 9-hr. day would be approximately 30,000 pieces, which is pointed out as being two to three times faster than by hand feeding.

A long stroke is used with this feed so that work is pushed from the magazine directly to the die without stopping at intermediate stations. One piece does not push another piece ahead of it. If a blank should lock in the magazine, a spring pin is unlatched which stops

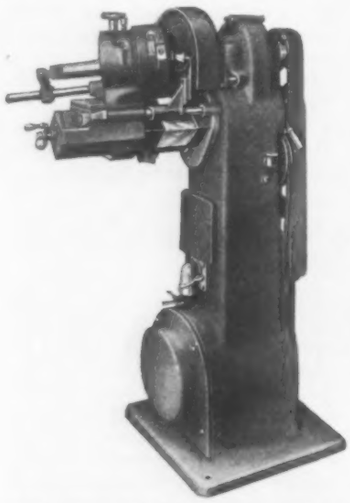
the magazine from feeding, which prevents breakage of parts. After the forming operation, the work is lifted out of the die either by the punch or blown out by air. It is stated that in most cases it is better to lift

Automatic Magazine Feed for Presses Which Are Fed in an Inclined Position. Accident prevention and increase of production are claimed

the work with the punch using the bar knock-out in the slide for pushing the piece off the punch and then blowing it clear with air. Magazines and pushers of various shapes can be used with the automatic feed, making it adaptable to feeding a wide range of forming work.

Improved Drill Pointing Machine

Increased speed of operation and wider range of application are general results of comprehensive improvements incorporated in the automatic drill pointer



Improvements Are Said to Result in Simplification of the Mechanism and Increased Speed of Operation. Bent shank drills may now be ground accurately. Forced feed lubrication is provided and bearings are completely housed

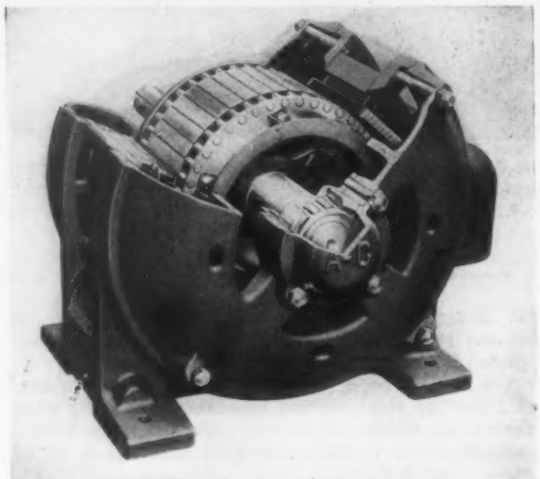
of the Oliver Instrument Co., Adrian, Mich., which was shown in operation at recent machine-tool expositions. The mechanism has been simplified and among other new features is the provision of handling bent drills and the inclosing of all bearings to prevent the entrance of grit and dust. The previous model, was placed on the market in 1921, and described in THE IRON AGE of June 30 of that year.

In the new machine the rocker arm has been eliminated, cross motion of the wheel being obtained by an eccentric quill. The drill holder has been redesigned, and the drill is held in a two-jaw chuck immediately back of the point instead of by the shank, which permits of accurate grinding of bent drills. The drill-holding chuck may be centered or set for off-center grinding, as desired. The path of the drill on the wheel has been changed to produce a drill point that is slightly stronger at the cutting edge; otherwise the point is the same as previously. Having the clearance cam concentric with the wheel spindle is claimed to eliminate lost motion between the cam and drill. To eliminate danger to the operator's fingers when setting up the drill, the lip rest is arranged for operation by means of a lever located back of the drill holder.

An emery wheel dresser of improved design, and which can be put into instant use, has been provided, and the wheelguard has been redesigned to permit a direct flow of sparks and emery away from the machine. The operating lever has been placed on the right hand side of the machine, which is more convenient for the operator. Forced feed lubrication to all bearings and gears is a feature, and the feed screw and nut have been entirely enclosed. By rotating the drills being ground continuously instead of intermittently, as before, the grinding speed is said to be increased approximately 50 per cent.

Motors with Tapered Roller Bearings

After two years of development work, the Allis-Chalmers Mfg. Co., Milwaukee, is placing on the market a line of 25- and 60-cycle squirrel-cage and slip ring induction motors equipped with Timken tapered roller bearings. Ability to withstand con-



tinued heavy radial and thrust loads without undue heating or appreciable wear is claimed for the bearings, it being claimed also that because of the rolling action of the bearing, wear is minimized so that the factory-adjusted air gap is maintained indefinitely.

The bearings are enclosed in grease tight housings, which protect them from dirt and abrasive matter and which require repacking with grease only at infrequent intervals. The bearings are mounted with a light press fit for both the cone and cup and do not require the use of a locknut or other means of holding the races in place, facilitating removal of bearings.

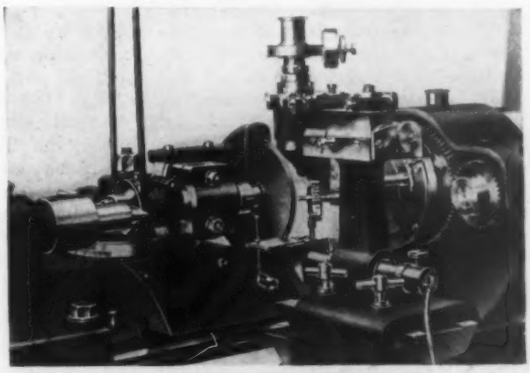
The motor is available in ratings up to 200 hp. In addition to the bearings, other features of this new line of motors include the design of the frame, which is of steel with the feet cast integral, to withstand shocks encountered in use with the company's crushers, grinders and other machinery. To withstand severe conditions of moisture such as often accompany centrifugal pump service, the coils of the motor are thoroughly insulated, treated with water-proof varnish and baked. The openings in the housings and frames for ventilation, are placed in vertical planes so that falling objects cannot enter the motor.

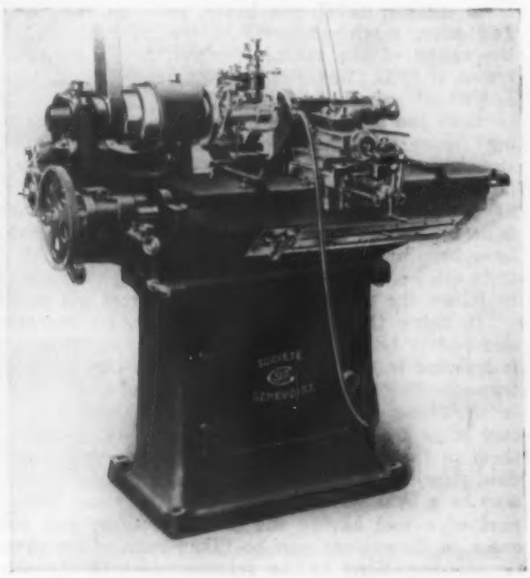
THREAD GRINDING MACHINE

Lead Screw Accuracy Featured — Microscope Checks Wheel Profile and Work

The correction of changes in the pitch and diameters of screw threads caused by hardening is the function of the machine illustrated, which has been developed by the Société Genevoise d'Instruments de Physique, Geneva, Switzerland, and is being introduced into this market by the R. Y. Ferner Co., Investment Building, Washington.

The work to be ground is mounted between centers, the distance between which is 12 in. External threads up to 6 in. in diameter may be ground, and also internal threads ranging from 1¼ to 5 in. in diameter. The lead screw of the machine has five threads per inch.





External Threads Up to 6 In. in Diameter May Be Ground. The automatic compensator for errors of lead screw and adjustment of temperature is shown in the front view (at the right). The measuring microscope for testing work and the profile of the abrasive wheel may be noted from the rear view (above)

Change gears are provided to give from 26 to 3 threads per inch as well as metric pitches ranging from 0.8 to 7 mm.; a total of 18 inch and 16 metric pitches. Six work speeds, from 100 to 300 r.p.m., are provided. The speed of the grinding wheel is 1400 r.p.m.

Two essentials provided are a highly accurate lead screw and protection of the slides of the machine from the entrance of water and emery dust. The lead screw is guaranteed to 0.002 mm. (0.0001 in.) for a length of 300 mm. (12 in.) and on shorter length it is claimed that still higher accuracy is to be obtained. The slides of the machine are entirely inclosed.

The lead screw and nut is controlled by a correcting guide or templet, seen at the front of the machine. The templet has been cut in accordance with the measured errors of the screw, and thus, through its connection to the nut of the lead screw, compensates automatically for small errors in the lead screw. This guide or templet may be adjusted about a pivot at its right-hand end to provide for pitches at any temperature between 32 and 68 deg. Fahr.

The grinding wheel spindle can be tilted sufficiently to bring the plane of the wheel parallel to the helix angle of the thread to be ground. The support of the wheel is provided with two micrometer adjustments, one to control the depth of the cut, and the other the lateral movements of the wheel in the screw thread. An eccentric lever is provided for quick withdrawal of the wheel at the end of the cut before returning it to the starting point; this is accomplished without altering the adjustment of the micrometer screw. The drums of these micrometer screws are graduated to read to 0.005 mm., or to 0.0002 in. when the machine is graduated on the inch system.

The shape of the thread is obtained from the profile of the grinding wheel. The latter is formed by means of a special device consisting of a carriage equipped with a diamond point, which is capable of being turned about a vertical axis, its movement being measured by a graduated circle reading to minutes. This serves to regulate the angle of the profile of the wheel.

A vertical micrometer microscope is mounted over the edge of the wheel and thus provides a means of checking the profile as it is being made, and also of measuring the angle, depth and pitch of the threads during the process of grinding. For this purpose the eyepiece of the microscope is fitted with two crossed wires at an angle of 60 deg., or, if desired for Whitworth threads, at 55 deg., and is also provided with movable wires controlled by a micrometer reading to 0.0002 in. Illumination from below is furnished by the use of a rightangle prism and an electric lamp mounted in the base of the microscope support. The microscope cannot be used, of course, for examining the work during internal grinding, but the simple positioning of the emery wheel is said to permit frequent examination of the wheel to assure the correct form of thread.

The work is mounted between dead centers, a work carrier being driven by an index finger mounted on a dividing plate carried by the face plate. The dividing plate is graduated and may be moved relatively to the face plate to permit the grinding of the threads of screws that have more than one thread.

In grinding threads the first operation, that of grinding the outside diameter with a flat-faced wheel, may be done on an ordinary grinding machine, the machine illustrated being reserved for pitch correction and crest shaping. If it is desired to use the Société Genevoise machine for grinding outside diameters, however, the change wheels can be disconnected and the feed across the work is done by hand. When grinding thread flanks, the grinding wheel is brought into contact with both flanks simultaneously. The motion of the table during grinding is from right to left. Overall length of the machine is 59 in. and width 33 in. The net weight is approximately 1430 lb.

The description of the hull and machinery installations of the U. S. Ss. Dobbin and Whitney, by Lewis H. Kenney, engineer, United States Navy Yard, Philadelphia, which appeared in the *Journal of the American Society of Naval Engineers* for August, has been reprinted. It includes a description of the foundry, machine shop, forge and other shops on the ships. The machining of the reduction gears for these ships was described in THE IRON AGE of Jan. 22.

TOOL ROOM MILLER

Functions of Several Machine Tools Combined in One—Convenient Control a Feature

The toolroom milling machine of the Keller Mechanical Engineering Corporation, Brooklyn, N. Y., mentioned in reports of the new equipment shown at the exhibitions of machine tools recently held at New Haven and Cleveland, respectively, is here illustrated. It has been designed to meet every requirement of the toolroom, die and metal pattern shop, combining the functions of several machine tools.

In addition to drilling, plain or face milling, jig boring, reaming, gear cutting, etc., the machine may be used for making a variety of dies, including dies for blanking, trimming, embossing, forming, punching, forging and molding. It is adapted also for making punches, pressure pads, cams, templates, gages, jigs, form cutters, metal core boxes, patterns, match plates and other machined parts of irregular shape within the range of the machine, which has a longitudinal travel of 16 in., and a cross movement of 8 in., with an additional spindle adjustment of 4 in.

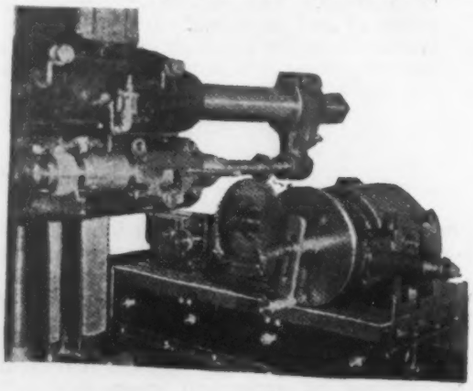
Both the semi-automatic two dimensional (contouring) movement and the full automatic three dimensional movement that have proved successful on the larger die sinking machines of the Keller company have been incorporated in the toolroom miller, which is designated as the type BL. In addition, handwheels have been provided for all three movements. All controls are located so as to make it easy for the operator to follow the progress of the work from his position.

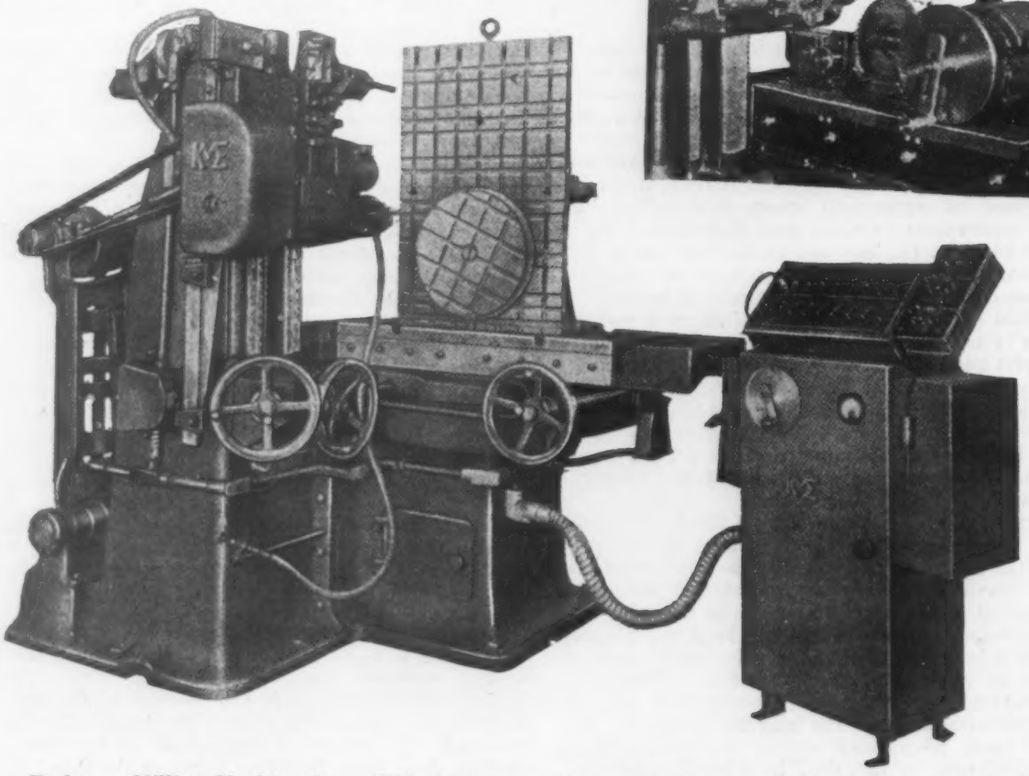
In using the machine as a miller, an overarm is clamped in bearings in the saddle and a cutter arbor is inserted in the spindle, as shown in the insert illustration. The arbor can be supported either at the end or anywhere along its length. For jig boring micrometer stops can be furnished, provision being made for them in the table and column. For cutting blanking dies, punches or for other contouring work, the master may be a thin metal template or a previous operation part or a tool having the correct outline, and differences in dimensions can be taken care of by proportionate variations in the relative sizes of the tracer and the cutter. For cutting cavities or reliefs with the full automatic control, a master of lead, cement, plaster, wood or other easily shaped material may be used.

The spindle drive is through wide belts, running on four-step cones, and provision is made for maintaining belt tension. Twelve spindle speeds ranging from 80 to 3600 r.p.m. are provided. Power for the cutter is supplied by a 2 hp. motor mounted on the base of the machine, and each of the three feed movements has its individual drive unit, which is actuated by a ¼ hp. ball-bearing variable speed motor mounted at the end of its respective lead screw. Each feed drive motor is geared to the drive side of a two-direction magnetic clutch, which is electrically controlled. Control of all power driven functions by means of a push button attached to a flexible cord and carried in the operator's hand is a feature. The high-speed spindle of the machine is equipped with roller bearings and is bored for a No. 7 B & S taper shank, the standard slow speed spindle running in bronze bushings and being bored for a No. 9 B & S taper shank.

The working surface of the table is 22⅛ by 42 in. The base casting which supports the work table with its longitudinal and cross slides and large oil pan, is strongly ribbed and weighs approximately 1180 lb. The weight of the column, with the vertical slides carrying the saddle and spindle head, is 1320 lb. The machine complete weighs 7500 lb. All slides have widely spaced supporting bearings, and two narrow parallel guides are provided on either side of the lead screw to prevent jamming and assure accurate alinement. Gibs are provided on guides and bearings to take up wear. Lubrication is through sight feed oil cups and by packing the ball bearings.

The machine is available as full automatic, with automatic operation in three dimensions; or as semi-automatic, with automatic vertical and horizontal movement and cross adjustment by hand control.





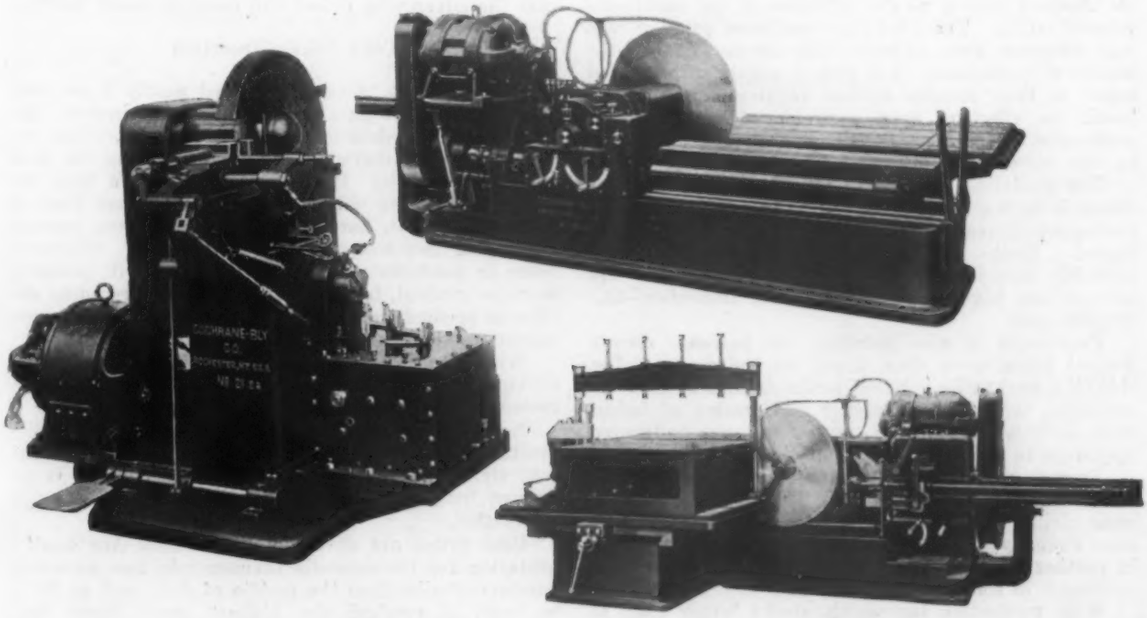
Toolroom Milling Machine for a Wide Variety of Die and Toolroom and Metal Pattern Shop Work. Full or semi-automatic electrical control, as well as hand control, may be provided. The insert shows the machine set up for milling gear teeth

NEW SAWING MACHINES

One an Automatic Cut-Off Unit, Another a Cold Saw with 48-In. Saw Travel

Two new machines, an automatic cut-off saw for bars, tubes and extruded sections of non-ferrous metals and other material; and a combination cold saw with 48-in. saw travel have been placed on the market by the Cochrane-Bly Co., Rochester, N. Y.

In addition to the uses mentioned, the automatic cut-off saw may be employed for cutting wood, fiber, hard rubber and bakelite and, equipped with an abrasive disk, for cutting magnet steel, hardened drill rod, tool bits, etc. This machine, shown in the left-hand illustration herewith, is equipped with coolant pump and piping, the oil or compound being pumped from a reservoir in the column to each side of the saw blade, close up to the collars. Centrifugal force distributes the lubricant, cooling the blade and lubricating the teeth.



The Automatic Cut-Off Saw Is Shown at the Left. Front and rear views of the combination cold saw with 48-in. saw travel for square or miter cutting of I-beams, channels and other sections, are at the right. Mounting of the feed screw above the ways and close to the saw blade is a feature of the cold saw

The travel of the carriage is adjustable from ½ in. to 4¼ in., and the speed may be varied from 1 to 30 strokes per minu., there being 18 changes. The carriage is also adjustable with relation to the vise which permits of compensating for wear of blades and for varying position of work in the vise. The vise will accommodate work 4 in. in diameter. It is operated automatically in time with the movement of the carriage, the movement of the vise jaw being adjustable from zero to ½ in.

The spindle runs in Timken roller bearings mounted in dust proof cases. The machine is equipped with an antomatic positive clutch which is engaged by means of the foot treadle. Upon release of the treadle the machine will make one stroke and stop with the blade in the back position, while if the treadle is held or locked, the machine runs continuously. Special operating cams may be used to give speeds up to 120 strokes per min. and automatic feeds may be provided for special work. Arranged for belt drive the machine weighs approximately 2150 lb. net. The floor space occupied is approximately 48 x 50 in.

Combination Cold Saw for I-Beams, Etc.

In the combination cold saw shown in the right-hand illustrations the Cochrane-Bly Co. has developed a machine with 48 in. saw travel for square or miter cutting of I-beams, channels and other sections. The special feature of the company's standard machine has been retained, the feed screw being mounted above the ways and close up to the saw blade, in which construction the feed thrust is claimed to be nearly in line with the blade resistance.

In sawing an I-beam or channel on the top table, the carriage passes under the work, the cutting resistance being said to be nearly in line with the feed or carriage travel instead of at right angles as when the work is on a level with the saw arbor. The position of the feed screw is stressed therefore as tending to eliminate cant of the carriage and accompanying vibration.

In the cutting of light sections only one tooth is engaged in the metal at one time and this tends to cause chatter and vibration and to dull the blade rapidly. To eliminate this, the saw arbor is geared to a band brake which is intended to take up lost motion and hold the blade steady.

With the upper tables removed, the machine has capacity for cutting 21 in. I-beams in the vertical position, or round bars up to 10 in. in diameter. The machine is driven through a friction clutch and sliding gear transmission with hardened nickel steel gears running in an oil bath. Cutting speeds of 30, 40 and 50 ft. per min. are obtained. The feed is geared and positive and provides 11 changes, ranging from ⅛ to 2½ in. per min. and rapid power traverse to carriage in both directions is provided. The friction clutch, feeds and rapid traverse are under control from either front or rear working positions.

The size of the top table is 35 by 40 in. and of the bottom table, 35 by 63 in. Capacities are as follows: On the top table, flat sections, 36 in.; vertical sections, 9¼ in.; I-beams, square cut, 36 in. by 8¾ in., and I-beams, miter cut, 25 in. by 8¾ in. On bottom table, the capacity is for I-beams, vertical, square cut, 21 in. by 8 in., and vertical, miter cut, 15 in. by 7 in. The capacity for face milling on the bottom table is 32 in. by 21 in. The floor space required by the motor driven machine is 6 ft. 6 in. by 13 ft. 2 in. The net weight is about 15,000 lb. A 15-hp. motor is required.

Steel barrels produced in August totaled 498,449, according to the Department of Commerce. Shipments were 495,736 and unfilled orders at the end of the month were 1,114,667. Production was slightly above July, but below the four preceding months, keeping pace substantially with orders, for the increase in unfilled orders was under 1 per cent.

Upward Movement of Fuel Prices Probably Close to Completion

Anthracite Strike Furnishes Insufficient Reason for Further Rise in Bituminous Coal—Coal Production on Increase

BY DR. LEWIS H. HANEY
DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

THE recent rise in price of bituminous coal is credited largely to the influence of the anthracite miners' strike. The *Coal Age* composite price of soft coal advanced from $1.93 on July 20 to $2.24 by the middle of September. But with a supply of hard coal equal to four months normal requirements now on hand, the effect of even a prolonged strike of the anthracite unions appears to have been well discounted by the increase in bituminous coal prices.

The statistical position of bituminous coal has lost strength during the month; on the basis of stocks and production it seems unlikely that prices will go much higher. Stocks of soft coal increased more than 8,000,000 tons during the month of August and are now at the highest point since last December—54,487,000 tons.

Production is also gaining; the increase during August being more than usual for the season. For this, the anthracite miners' strike is undoubtedly responsible, though the expected acceleration of industrial activity this winter may also have influenced operators to boost the output of their mines.

August production was estimated at 45,267,000 tons, which compares with 35,238,000 tons for the same month last year. This is the largest production since January. The opening of union bituminous mines in southern Illinois and Ohio indicates the operators' confidence in continued high demand.

With production increasing, stocks larger than at any time this year and the possibility of a sudden end to the anthracite strike at any time, it seems unlikely that the advance in prices will continue much further.

Coke Prices Uncertain

THE production of coke increased nearly 2 per cent in August, a gain in the output of beehive offsetting a small decline in by-product coke. This reverses a steady decline in production during the four preceding months. Present indications are that the September output will be even greater than that of August and that, barring labor troubles, the upward trend will continue for several months. Whatever gains in production are made, however, will probably be quite gradual, for the reason that the preceding decline in production was only moderate and the August output was 30 per cent above that of a year ago.

While the demand for coke should continue strong during the remainder of the year, much further increase in production would tend to depress prices.

As in the case of coal the possibility of labor difficulties exists, and it will be remembered what the coal strike did to coke prices in 1922. There is no present indication, however, of the repetition of such a situation.

Coke prices are advancing. THE IRON AGE weekly quotation for Connellsville furnace coke has advanced uninterruptedly since the middle of July and at $3.75 on Sept. 22 reached the highest point since Feb. 10, 1925.

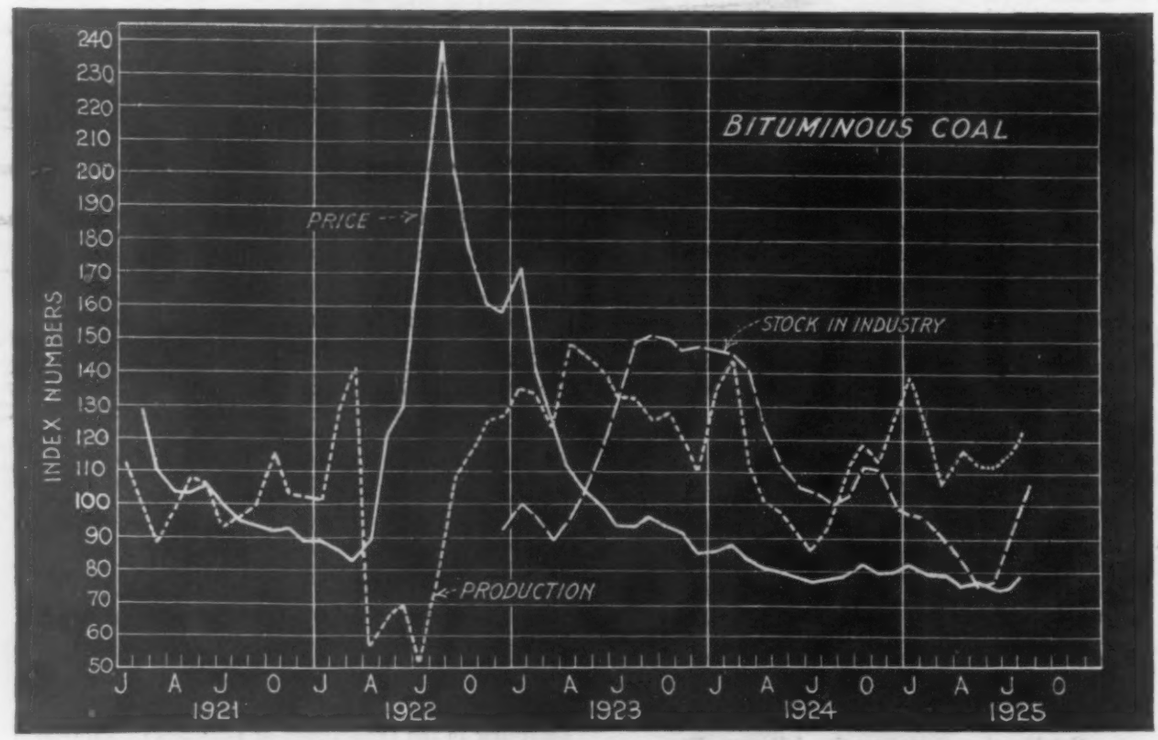


Fig. 1—Stocks of Bituminous Coal Have Recently Taken a Sharp Jump; Production Has Also Been Increasing, Indicating That Fear of a Long-Continued Anthracite Strike Has Been Well Discounted

In This Issue

Year without "Pittsburgh Plus" has been one of keen competition, caused by absence of backlog orders.—Harder to keep track of prices today, but no other effect has been noticeable.—Page 900.

Stocks of coal highest since last December.—And with production also on upgrade further price increases, due to fear of anthracite strike, seem unlikely.—Page 896.

Steel-consuming industries operating at lower per cent of capacity than steel mills.—And steel-consuming capacity has grown faster than steel-productive capacity.—Page 901.

Seek to effect compromise on bids for structural steel in New York City.—Fabricators demand "reasonably complete plans" to enable lump-sum bids after Nov. 1.—Page 906.

Middle-aged men prove best crane operators.—Young men too apt to be reckless; good eyesight essential to crane handling.—Page 886.

Exports of agricultural implements reached record peak in August.—And metal-working machinery exports have totalled more than $1,000,000 monthly for six consecutive months.—Page 900.

Building costs stabilized at high level.—Considerably below 1923 average but still close to level of last year.—Page 899.

Steel companies produce more than 2,200,000 tons of pig iron in 30 days of September.—Or 30,000 tons more than output of steel mill blast furnaces in 31 August days. Gain of seven in active steel company blast furnaces.—Page 912.

Recourse to expensive alloys for steel castings to secure strength and toughness often unnecessary. — Manganese alone will frequently solve the problem, as shown by condensed results of 1800 tests on 1.25 per cent manganese steel.—Page 879.

Four 125-ton open-hearth furnaces placed in operation at Fairfield, Ala., works of Tennessee Coal, Iron & Railroad Co.—Built to use either tar or by-product gas, or both together.—Page 887.

Is there a direct relation between continuous immersion tests in water and corrosion in the air?—A. S. T. M. committee report indicates none: Columbia research says relation between atmospheric and forced electrolytic corrosion is very close.—Page 908.

Standardization conference agrees to eliminate 459,000 sizes of grinding wheels.—Program applicable for one year goes into effect Jan. 1; stocks to be cleared by July 1, 1926.—Page 909.

High melting temperatures and other properties of Bosshardt steel furnace enable Freund Works in Berlin to produce unusual steel.—Claimed to be 25 per cent stronger than average low carbon steel.—Page 936.

American Rolling Mill Co. cuts accident frequency to one-fourth average for industry.—Constant campaign to impress need of caution on worker yields remarkable results.—Page 885.

American Iron and Steel Institute appoints committee to revise capacity records.—John A. Topping, James A. Farrell and Eugene G. Grace will study mill capacities.—Page 929.

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On the Basis of Performance

Time given to the study of more efficient equipment is time well spent. But not every buying executive can afford the time to make a thorough examination of the merits of each new piece of machinery that is placed on the market. For this reason THE IRON AGE makes a special effort in its descriptions of new equipment to display the productive features rather than present a perfunctory summary of construction details.

Each machine is analyzed with a view to separating the chaff from the wheat and concentrating the useful data in the most helpful manner. Hence THE IRON AGE recommends to its readers these descriptions of the working values of new machinery in the belief that the information thus presented may become a definitely calculable factor in shop profits.

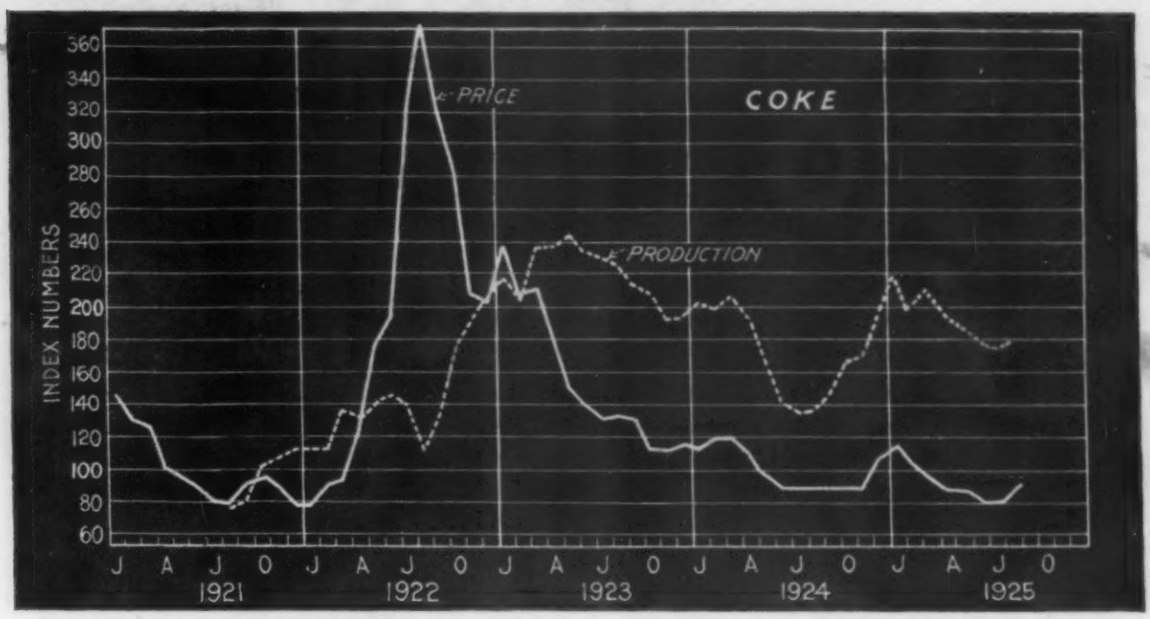

Fig. 2—Coke Prices Have Been Affected by the Anthracite Miners' Strike in the Same Manner as Prices of Bituminous Coal

Recent increases in the price of furnace coke are chiefly due to labor troubles in the anthracite fields. To this extent their continuation is as uncertain as the duration of the anthracite strike.

Uncertainty as to the future price of coke is naturally affecting the pig iron business. The market for pig iron does not seem strong enough to support the rapidly increasing cost of coke. The time may soon come, therefore, when coke prices will have to be moderated.

Building Costs Still High

AS shown in Fig. 3 building costs have been very stable at a level not much different from that of a year ago, although decidedly under the 1923 peak, the facts are as follows:

	Cement Factory Building (1914=100)	Frame House (1913=100)	Building Materials (1913=100)
August, 1924.....	196	195	169.2
June, 1925.....	194	197	170.7
July, 1925.....	194	195	170.1
August, 1925.....	194	195	172.4

Evidently the average price of building materials increased somewhat in August, but the average cost of building was unchanged from July.

A point to remember is that cost alone can not keep values up. Demand has to be reckoned with.

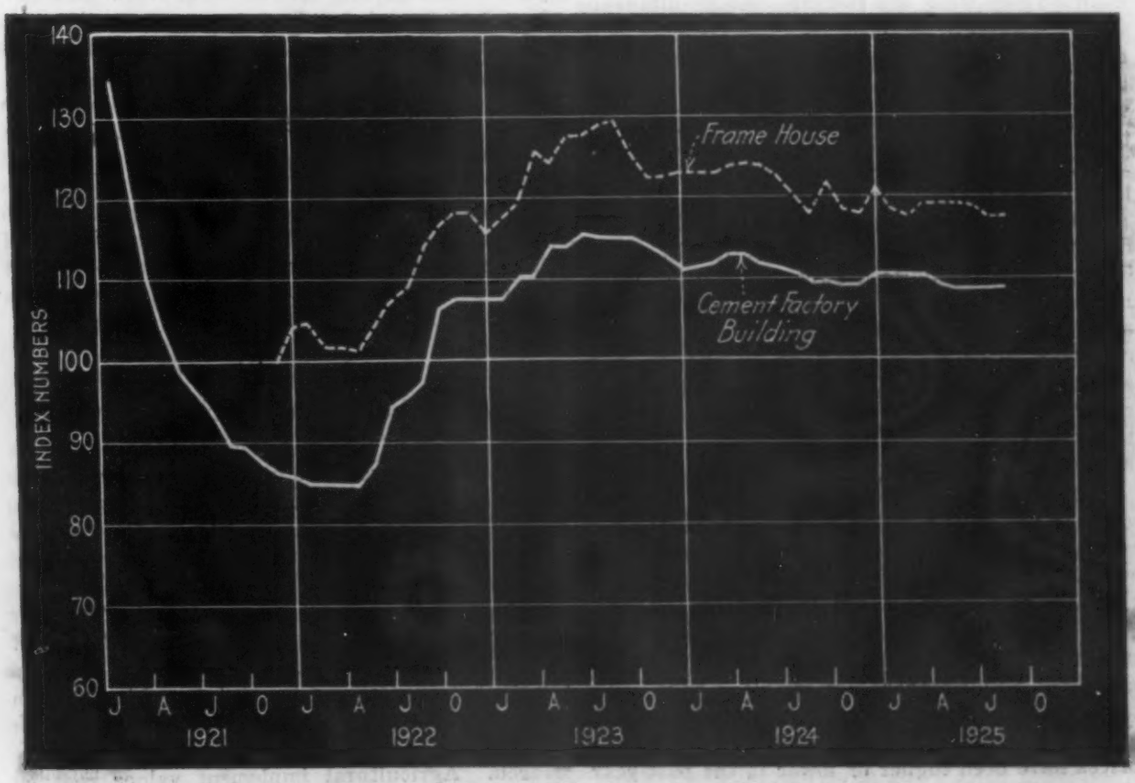

Fig. 3—Building Costs Have Been Well Stabilized at a Level Slightly Below That of Last Year

ESTABLISHED 1855

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A Year Without "Pittsburgh Plus"

IT is a pity a demand cannot be made upon those who were counting up the savings steel buyers would make by the abolition of Pittsburgh Plus to show that the savings have been secured, now that a year has elapsed since the final abandonment of the system. It would be interesting, too, to know what kind of a rejoinder would be made if it were pointed out that factories have not been pulling up stakes and moving as predicted.

Of course, it was easy at the time to see that much of the talk about Pittsburgh Plus and what would result from its elimination was wholly chaff. There were, for instance, the simultaneous claims both that production of steel would move from Pittsburgh to Chicago and that consumption of steel would do likewise. If so, there would be some steel mills in the Pittsburgh district for rent cheap, resulting in cheap steel for Pittsburgh and some of the consumers moving back to get the benefit of it.

However, something has occurred, and undoubtedly a great deal. The question is, what? The change was quite a sweeping one, although not nearly so sweeping as was claimed by those arrayed against the Pittsburgh Plus System, because much of the alleged system was not in operation. For instance, Chicago developed a separate basing on bars, shapes and plates in the latter part of 1921, not after the Federal Trade Commission's order, but three years before.

To answer fully the question what occurred as a result of the order complied with fully a year ago, it would be necessary to set down what would have occurred in the steel market during the past year if the order has not been issued. That is simply impossible. Sometimes steel prices rise, sometimes they fall; and when all the attendant circumstances are visible it is difficult to assign to each its true weight or influence.

The question is chiefly this, whether steel prices have been higher or lower in the past year than would have been the case if the complainants before the Federal Trade Commission had lost their case. No one can say positively, but a careful consideration of the details of the steel market in the intervening period shows that there has been very active competition among sellers. The competition has been unusually active and continuous because the sellers at no time secured much of a back-log, being forced therefore to press for sales all the time in order to maintain operations.

The sellers have had more prices to maintain, or try to maintain, than formerly. Did this make their position easier or more difficult? A given seller might be more prone to cut a delivered price when it was a case only of a market in a particular area, but on the other hand such cutting had less influence upon market prices in other sections than if all the prices were referable to a common base at Pittsburgh.

Certainly it is reasonably clear that there is no great difference in selling prices between what has occurred and what would have occurred, and it is very clear that both sellers and buyers have had much more work to do to keep posted as to conditions. Even at that, many buyers would probably confess that they have known less about the general state of the market than they used to know.

Large Steel and Machinery Exports

EXPORTS of iron and steel and their products in August were the highest the United States has known for many months. In tonnage items, at 188,963 tons, the month exceeded all others since January, 1924, when 247,942 tons was sent abroad. In machinery (excluding vehicles) the shipments, at $38,768,823, exceeded all other similar values since March, 1921, when a total of $45,795,556 was recorded. In the particular group of machinery designed for metal-working a sixth successive $1,000,000 month was reached, with $1,308,372. This was the largest amount since March. Agricultural implement values reached the highest figure ever attained, at $11,318,423, a gain of no less than 42 per cent upon the previous high record, $7,960,824 in April last.

With a surprisingly large percentage of our machinery exports going to our chief competitors, England and Germany, the outlook, as analyzed at New Haven by Mr. Rastall (chief of the industrial machinery division, Department of Commerce) and reported in these columns two weeks ago, is exceptionally promising.

Heavy Steel Consumption Easy

SINCE the war several surprises have been furnished by the ease with which steel was produced. The whole thing is now almost forgotten, since it was taken as perfectly natural and normal that steel production should speed up rapidly when opportunity is offered by the placing of orders. Some steel producers even seem to feel that the industry is on the defensive, by having a capacity quite in excess of the average demands made upon it.

The importance of another point has been largely overlooked, that it has grown very easy to consume steel. A given volume of steel consumption entails very much less strain upon the consuming industries than it has in the past. Thus the prospects for large consumption in future are improved.

It is helpful to recall the steel industry's troubles, so recent in point of years that it seems strange the memory has grown so dim. After the steel strike of late 1919 it was thought it would require months for the steel industry to get into good running shape again. A favorite prediction late in December, 1919, was that the mills would do well to reach 80 per cent of the pre-strike operation by March. What occurred was that January, 1920, showed a rate 4 per cent above that of August, 1919, the pre-strike month, and March was 11 per cent over the January rate. Then came transportation trouble.

The abolition of the 12-hour day occurred in the late months of 1923, and was expected, by labor shortage, to retard the steel industry in speeding up, but March, 1924, brought a rate higher than the highest rate attained in 1923, although it turned out that 1924 was not so good a tonnage year as 1923 by 15 per cent.

At the present time the production of steel is running at a high rate relative to the average since the war, but the fact that the rate is considerably below the obvious capacity and further still below the theoretical or nominal capacity has been regarded as somewhat unfavorable to the producers.

Consider, however, how matters stand with the consumers. This heavy output of steel is being currently consumed, yet where is the steel consuming industry whose facilities are taxed? Do these industries show higher operating rates, in percentage of capacity, than does the steel industry? Not at all. The majority of them, if called upon to report, would name percentages below what properly may be ascribed to the steel industry.

The automobile industry has presented some figures, as to reduction of man-hours per unit of production, that are extreme. Other and older lines have shown less rapid change. But the significant thing in all metal-working lines is that manufacturing buyers of steel are in the same case with the producers. Perhaps if all the facts could be collated and analyzed it would be found that while it has grown easier to produce steel it has grown still easier to consume steel. It is natural law, well recognized, that such a change will work strongly in the direction of swelling the demand for steel.

The Anthracite Smoke Screen

ANTHRACITE operators and miners' leaders have been engaging in exchanges of the same old order that merely bewilder the public and make it tired. Even the newspapers are tired, for they do not give much space to the them and is weary of all of them. However we should more properly say that the newspapers refuse to waste space on them, out of their consciousness that the public does not believe any of them and is weary of all of them. However we may deprecate the daily press, we are bound to allow that its editors are experienced caterers to public taste, wishes and interests.

A coal mining company presents figures showing how little money it has earned. A miner's leader compares the cost of producing coal and the retail price to domestic consumers. The counsel for the operators deplores that the miners refused to arbitrate anything. The president of the union retorts that no one ever arbitrates a commercial bargain. So it goes, in the old, familiar terms.

Are the anthracite miners well paid or ill-paid? The public does not know, yet that is the simple thing it would like to know. The system of remunerating labor in the anthracite mines is complicated. There are daily wage rates, and piece work rates, and contract rates. In a recent number of the monthly review of the Department of Labor there was a report on this subject, a report bristling with figures, but it was worse than a Chinese puzzle for any one trying to compare the wage of the Pennsylvania anthracite miner with that of the New York bricklayer or the Philadelphia carpenter.

What is the average remuneration of the anthracite miner? How does it compare with 1913 base? How does it compare with other remunerations? With those questions answered, we might proceed to consideration of degree of skill required, hazards incurred, living conditions, etc. But those simple questions have never been positively answered. The U. S. Coal Commission failed to do it. The anthracite operators have never done it. The union itself probably can not do it and knows no more in respect to it than any one else.

The personnel of the anthracite mines, about 150,000 in number, comprises many classes of workers whose daily rates and annual earnings differ widely, just as in every great industry. An industrial average gives us, nevertheless, a fair idea of things. Divide the total annual disbursement for labor by the number of days of work

done and multiply by the average number of days worked. Any industry that can not do that arithmetical problem ought to organize its accounting so that it can.

Faulty Technical Writing

E. W. ALLEN, chief of the experiment station of the United States Department of Agriculture, stimulated by the remark of Sir James Barrie that "the man of science appears to be the only man who does not know how to say it," severely criticizes much of the work produced by the scientific writers of the present day. He charges them with being "loose and indefinite in expression, verbose almost to the point of being tedious, and out of harmony with the ordered, exact and logical nature of science itself."

Some one else has said of such writers that they might be divided into three classes—those who can write well and do, those who think they can write well and do not, and those who, knowing their limitations in a literary way, and having a high standard for any work which they are called upon to undertake, exaggerate their weaknesses and enter upon the task of writing with so much diffidence that they do not do nearly so well as they could were they to write naturally.

Some men have a natural bent for clear expression in writing. The average person, however, must be trained, and thoroughly trained; and it is undoubtedly a fact that many men educated in science suffer from the neglect of their English in their school and college days. There are first rate engineers who fall down in their reports or in papers prepared for society meetings or for publication. Others, similarly lacking, wisely seek assistance in their writing, realizing and frankly stating their limitations. Some writers are handicapped because they resent criticism; their literary offspring may not be spoken against.

Under the present curriculum of scientific and engineering schools English cannot be made a course of primary importance. There is not enough time for it. Yet this does not excuse a man for not making the best possible use of all the training he has had in classroom and through his reading. And always there is the friendly critic who would point out errors, not alone of grammar, but against clarity and sequence. A great blot is ambiguity. The average engineer does not hesitate to seek the advice of a consultant in his own or a kindred profession. A good old newspaper adage may be recalled with profit—that no man can edit his own writing so well as some other man can.

Negotiations for Sale of Rogers-Brown Iron Co.

Negotiations for the sale of the Rogers-Brown Iron Co., Buffalo, large producer of merchant pig iron, are under way, according to a telegraphic dispatch from Cleveland. The M. A. Hanna Co., Cleveland, which also has furnaces at Buffalo, as well as other interests, has submitted propositions for the purchase of some of the Rogers-Brown iron ore properties. Other reports have it that only the Rogers-Brown furnaces at Buffalo will be bought and that the mines will remain in their present ownership.

William S. Rogers, Rogers-Brown Iron Co., denied the report that a sale had been consummated but was noncommittal as to whether negotiations were on.

Sales of Fabricated Steel Plate in August

WASHINGTON, Sept. 29.—Bookings of fabricated steel plate in August totaled 26,210 net tons, based on reports from 35 concerns, with data for one estimate, according to the Bureau of the Census. This represented 39 per cent of capacity as against 43 per cent of capacity in July when, according to revised figures, bookings reported totaled 29,367 tons.

Of the August bookings 7500 tons were for oil storage tanks, 1377 tons for refinery materials and equipment, 596 tons for tank cars, 3671 tons for gas holders, 1240 tons for blast furnaces and 11,826 tons for stacks and miscellaneous purposes. For the eight months ended with August bookings were 210,455 tons, as against 184,829 tons for the corresponding period of last year.

Sees a Place for the Physicist

Disclaiming that the physicist had yet "arrived" in the foundry, but expressing firm belief that there was a place for such a specialist, R. R. Clarke, superintendent alloys foundry, General Electric Co., Erie, Pa., gave members of the Pittsburgh Foundrymen's Association much to ponder in his talk before that organization at its regular monthly meeting at the Fort Pitt Hotel, Pittsburgh, Monday evening, Sept. 21.

Physical laws being immutable and inexorable, the foundryman should look to the physical side of the matter for the explanation as to why two castings made from a given material and poured in the same way are not exactly the same. If there is a variation, it is the man rather than the material that has faltered, because physical conditions cannot change. He gave concrete illustrations by drawings and blackboard sketches to substantiate his assertions, and also exhibited castings further to carry conviction that variations were due to human rather than natural causes. The speaker confined himself to brass and, among other things, stressed the need of pouring temperatures about 500 deg. above the melting point of copper; proper gating of castings to avoid freezing, which he said was the cause of pin heads and pipes, produced by the fact that the chilling in the neck of the gate tended to draw the metal from the body of the casting.

Financial Status of Trumbull Steel Co.

The Trumbull Steel Co., Warren, Ohio, has assets of $50,324,000 and a book value of $32 for its common stock according to a financial report of the condition of the company on July 31 based on a new audit, given out Sept. 24 by its president, Philip Wick. For the five years and seven months ended July 31, earnings were $9,006,711, before paying Federal taxes, interest and dividends. Pending refinancing or a sharp increase in earnings, dividends on both common and preferred stock and preferred stock of its subsidiary, the Liberty Steel Co., will be omitted.

The personal indebtedness of Jonathan Warner, the founder and former president of that company, was estimated at $3,040,000. The report of the auditors showed that Mr. Warner had turned over to the trustee $1,533,618 in securities and real estate including his two residences, one in Youngstown and the other a country home near that city. In addition he surrendered 59,102 shares of the company's common stock. Current assets of the company as of July 1 were $12,388,844 and the value of the plant is placed at $35,032,151. The bank loans were $16,560,000 and the total indebtedness is placed at $20,823,024. Other liabilities listed include reserves, $918,947, preferred stock, $9,998,700, common no par stock (576,798 shares at $25), $14,419,950 and surplus $4,146,151.

Exhibit of Steel Mill Equipment*

Numerous Displays at Philadelphia Convention of Association of Iron and Steel Electrical Engineers

MORE than 200 booths, each 10 ft. square, were comprised within the area in the Philadelphia Commercial Museum which was set aside for equipment display. About 100 exhibitors were represented, of whom some 25 occupied two or more booth spaces. The General Electric Co., with nine adjoining spaces, and the Westinghouse Electric & Mfg. Co., with eight, had the largest areas. Four booths were taken by the Condit Electric Mfg. Co., by the Electric Service Supplies Co. and by the Reliance Electric and Engineering Co. Many exhibitors had machinery in motion or otherwise active. Prominent among these displays were those of the New Departure Mfg. Co., Bristol, Conn., the Tool Steel Gear & Pinion Co., Cincinnati; the Tinius Olsen Testing Machine Co., Philadelphia; Riehlé Brothers Testing Machine Co., Philadelphia, and S. K. F. Industries, Inc. The Alliance Machine Co. and the Morgan Engineering Co., both of Alliance, Ohio, showed working models of their ponderous open-hearth ladle cranes and other heavy equipment.

WHILE the general tenor of the whole display was electrical, there were many exhibits of apparatus other than motors, fuses, controllers and the like. Material-handling equipment, tools, lubricants, bearings, gears, testing machines, valves, furnace accessories, etc., all were represented. Of those already mentioned, Riehlé Brothers demonstrated high-temperature tensile tests of steel, having an electric furnace mounted between the jaws of a pulling machine. Tinius Olsen Testing Machine Co. showed a balancing machine designed especially for automobile crank shafts. It was arranged for rapid determination of the amount and position of unbalance, both static and dynamic.

Bearings were featured by the New Departure Mfg. Co., Hyatt Roller Bearing Co., Newark, N. J.; Rollway Bearings Co., Syracuse, N. Y.; Marlin-Rockwell Corporation, Jamestown, N. Y.; Norma-Hoffman Bearings Corporation, Stamford, Conn., and the S K F Industries, Inc., New York. In the New Departure exhibit a departure was made from that shown some time ago at New Haven,, wherein a succession of steel balls, falling upon a steel plate, bounded through an elevated suspended ring and fell upon another steel plate, thence bounding into a pocket and entering again into the sequence. In the present exhibit the ring, a ball-bearing race, was rotating about its own (vertical) diameter. This necessitated excellent timing between successive balls, that they might pass through the ring whi'e its opening was presented to them. The original exhibit was illustrated in THE IRON AGE, Sept. 27, 1923, page 841.

Rollway "double-width" bearings, alining bearings, high-speed bearings, thrust bearings for worm gears and crane-hook thrust bearings were shown. In addition, this company exhibited a line of housings for steel mill use. Norma-Hoffman exhibited open and closed type ball bearings, ball roller and thrust bearings and roller gages. Self-alining roller bearings and small high-precision ball bearings with free running qualities were demonstrated. The Hyatt exhibit was of roller bearings for mill motor use. The Marlin-Rockwell Corporation showed Gurney ball bearings with molybdenum steel balls.

Material handling, aside from the models shown by Alliance and Morgan, already mentioned, was represented by the Otis Elevator Co., New York, with samples of stop motion switches and of steel castings, by the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., and by the Baker L. & L. Co., Cleveland. Baker hy-lift truck, electric tractor and locomotive type crane were on exhibit. The latter, with a 70-in. wheelbase, 50-in. platform and 12-ft. boom, assisted in placing many of the heavier exhibits at the exposition, having been on duty for several days prior to the opening. The Shepard booth had a 2000-lb. low headroom hoist and a 500-lb. block stripping hoist. The Haywood Co., 50 Church Street, New York, showed photographs of cranes and crane buckets.

Electric welders were shown by the American Electric Fusion Corporation, Chicago, by the Acme Electric Welder Co., Los Angeles, and by the Economy Electric Products Co., Cleveland. The former showed a high-speed motor-driven automatic spot welder in operation. The Economy company had a heavy-duty 250-ampere portable arc welder weighing 550 lb., complete, mounted on 30-in. Ford wheels. This was designed to meet the requirements of the mill yard. The Acme exhibit was of portable and stationary units, featuring spot welders.

An electric hammer, striking 3600 blows a minute without motor or gears, was exhibited by the National Electric Mfg. Co., Pittsburgh. Known as the Syntron, this tool was designed for driving drills, chisels, stone points, bushing tools, etc. It is operated by electromagnets in conjunction with a recoil spring, and makes one forward stroke for each current alternation (60 cycles per second, for example). Tools shown by the Heppenstall Forge & Knife Co., Pittsburgh, included shear knives for hot cutting of steel. A display of rolling mill forgings made by this company featured a housing screw, all machined, and with a forged prolongation, showing the manner of taking test pieces to determine whether the screw has had proper heat treatment. A heat-treated tinning roll was shown, also.

Valves of various descriptions were shown by the Homestead Valve Mfg. Co., West Homestead, Pa. Among the newer products were the protected seat hydraulic operating valve and the protected seat globe valve. Three-way and four-way valves were shown. The protected seat operating valve is said to have exhibited a life of more than 19 months on exceptionally severe service. The American Pressed Steel Co., Philadelphia, showed safety stair treads and floor plate, featuring both the diamond and the ribbed pattern.

Flow meters, CO_2 recorders, indicating and recording pyrometers and draft and pressure indicators were displayed by the Republic Flow Meters Co., Chicago. Electrically operated flow meters, for gas, steam and water, are in use in over 130 steel plants. The Weston Electrical Instrument Corporation, Newark, N. J., had on exhibition a number of ammeters, volt meters, watt meters and other instruments.

Flexible couplings were shown by the Bartlett Hayward Co., Baltimore (Fast's pattern) and by the Thomas Flexible Coupling Co.

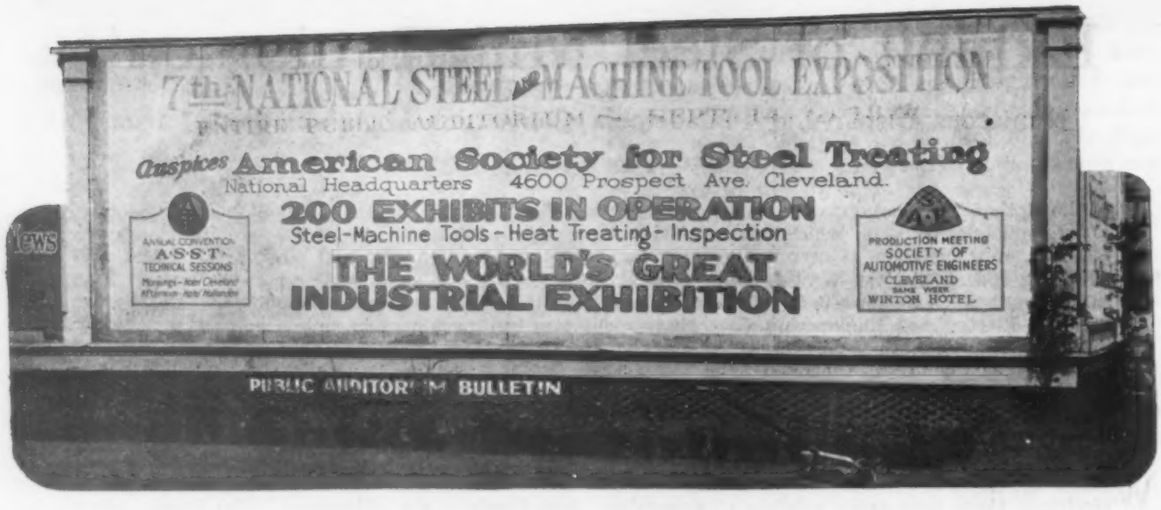
Ventilating fans for mines, forced and induced draft fans and pressure blowers were exhibited by the Robinson Ventilating Co., Pittsburgh. The "man-cooler" fan, designed to increase operating efficiency of personnel, was one of those shown.

Electric lifting magnets were featured by the Ohio Electric & Controller Co., Cleveland, together with control devices for operating them. In particular, ease of disconnecting or renewing parts were emphasized.

Furnaces and melting pots were exhibited by the General Furnace Co., Philadelphia, and Harold E. Trent, Philadelphia. The former had on display a large continuous roller-hearth electric furnace, insulated with Sil-o-Cel, an electric tempering oven, box furnace, electric melting pot, etc. These were shown

*See THE IRON AGE, Sept. 24, pages 827 to 830, for brief story of the convention of which this exhibition formed a part.

(*Concluded on page* 931)


7th NATIONAL STEEL and MACHINE TOOL EXPOSITION
Auspices American Society for Steel Treating
National Headquarters 4600 Prospect Ave. Cleveland.
200 EXHIBITS IN OPERATION
Steel-Machine Tools - Heat Treating - Inspection
THE WORLD'S GREAT INDUSTRIAL EXHIBITION
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PRODUCTION MEETING SOCIETY OF AUTOMOTIVE ENGINEERS CLEVELAND WINTON HOTEL
PUBLIC AUDITORIUM BULLETIN

Steel Treaters' Annual Exposition

New Record in Exhibitors and Attendance at Cleveland Show—Machine Tool Display a Feature

TAXING to capacity every available foot of space of Cleveland's large public auditorium, the National Steel and Machine Tool Exhibition, as it is now called, held Sept. 14 to 18, was the largest of its kind ever held in this country. Over $2,000,000 worth of material and equipment was said to have been displayed. The expansion of this exposition in six years to 45,000 sq. ft., or about 200 exhibitors, as against only 6500 sq. ft. for the number of exhibitors at the first one in 1919, is seven-fold. Last year at Boston 39,500 sq. ft. was occupied. Lack of room this year caused rejections up to 10,000 sq. ft. of exhibit space. This is pointed to as evidence of the importance of these shows to men in the metal-working industries.

The feature was a display of machine tools: There were 90 firms occupying about 20,000 sq. ft. of the total space, all under operating conditions—claimed the largest assemblage of this character in many years. Another feature was the large displays of steel producing companies, particularly in alloy steels, exceeding those of a year ago. The attendance, officially estimated at 46,000, was very large, particularly during the evening. New business and new contracts were reported as unusually good. The leading features are reported in the following:

Large Number of New Machine Tools

STEEL and the machine tools by means of which it is formed into the parts that make up the automobile and the many other mechanical servants of mankind, obviously form a natural association. At the machine tool section this association was perhaps more strongly suggested than usual because of the large number and variety of machine tools shown. Some 200 tools of more than 75 machine tool builders were demonstrated for the most part under actual production conditions, and the many machines exhibited for the first time was an impressive feature. New machines not described in THE IRON AGE heretofore will be included in forthcoming issues. In the following report, the exhibits in space of the manufacturers' agents are outlined first, followed by those of manufacturers exhibiting independently.

More than 44 machine tools, representing the products of some 19 builders, were exhibited in the space of the Motch & Merryweather Machinery Co., Cleveland.

The Cincinnati Bickford Tool Co., Cincinnati, had in operation the new 20-in. and 21-in. upright drills and the new 4-ft. 32-speed plain radial shown at the New Haven machine tool exhibition reported in THE IRON AGE of Sept. 17. The exhibit of the Avey Drilling Machine Co., Cincinnati, also followed that at New Haven, with four machines, including the new No. 1½, with motor mounted back of the spindles. Other machines of this general class shown was the No. 3 two-way horizontal duplex cam feed drilling and boring machine, of Baker Bros., Toledo, which was exhibited for the first time. This machine has a larger spindle and heavier frame than the No. 513, which it supersedes. It is a semi-automatic unit, the cam feed providing rapid advance and withdrawal of tools and permitting also of a tapping lead or dwell for facing, if desired. A No. 525 machine with capacity of 5½ in. in solid steel, and intended for heavy boring, drilling and facing operations, was also under power, as well as the company's No. 24 semi-automatic cam feed drilling machine for rapid drilling, boring and facing of medium heavy work.

A large exhibit was that of the Cincinnati Milling Machine Co., Cincinnati, which had in operation its new style No. 2M pyramid-column universal milling machine with roller bearings and inclosed motor drive, and a No. 3 plain high-power pyramid-column miller. A 24-in. duplex automatic miller, for quantity manufacture, was under power and the intermittent feed feature demonstrated. The company's 8-in. saddle type plain cylindrical grinding machine, previously described in these columns, was a feature of interest, as also the company's centerless grinder, which was equipped with magazine loading attachment and in operation grinding valve tappets.

Interest was shown in the type BL die and tool room milling machine of the Keller Mechanical Engineering Corporation, Brooklyn, N. Y., which was also exhibited at the New Haven machine tool exhibition. The same company also demonstrated its improved R-6 universal cutter and radius grinder and several flexible shaft machines, one of which, of bench type, was equipped with a high-speed attachment giving 10,500 r.p.m.

Convenient control, rapid power traverse and other features facilitating production were demonstrated in connection with a 36 x 36 in. x 8 ft. Hypro planer of the Cincinnati Planer Co., Cincinnati. Among the features of this machine which was recently described in THE IRON AGE are rapid power traverse, selective dial feed to all heads, single turn rail clamping device and instantaneous rail lift. A 32-in. Invincible shaper of Gould & Eberhardt, Newark, N. J., was shown for the first time, the company's 16-HS manufacturing hobbing machine being also in operation, cutting automobile transmission gears.

In lathes, the Lodge & Shipley Machine Tool Co., Cincinnati, had a 14-in. x 6 ft. selective head tool room lathe in operation, as well as its Duomatic lathe, which was demonstrated in turning all diameters and facing the gear diameters of Chandler automobile cluster gears.

The Bullard Machine Tool Co., Bridgeport, had a 42-in. vertical turret lathe under power, and the Acme Machine Tool Co., Cincinnati, demonstrated its No. 2 full universal turret lathe. Features of the latter machine include a 12-speed geared headstock with patented gear shift, new model rapid traverse and feed arrangements and cross slid-

ing turret and side carriage. In addition to its 2-A five-spindle automatic screw machine in operation making spark plug nuts involving ten operations and finished at the rate of 60 per min.

New Non-Stop Automatic

The Davenport Machine Tool Co., Inc., Rochester, N. Y., demonstrated its new non-stop semi-automatic. The machine is a single-purpose unit of double-ended rotary type, and is designed for the drilling, turning, threading and tapping of parts on a large production basis. As the head rotates, the parts are placed in the fixtures, the work clamped automatically, the machining completed and the piece ejected. The feed of the tools and clamping of work are controlled by stationary cams. A conveyor is employed for removing the work after it is ejected. The machine was set up for drilling oil holes, cross hole and cotter pin holes in shackle bolts, which were drilled with a ¼-in. drill, 1⅜ in. deep at the rate of 1200 pieces an hour.

Several grinding machines were shown in the space of the Motch & Merryweather company. The No. 12 Teromatic internal grinder of the Giddings & Lewis Machine Tool Co., Fond Du Lac, Wis., a self-contained full automatic machine for mass production, was in operation on roller bearing cones. Other machines included the No. 11 Teromatic internal grinder and its No. 45 high-power horizontal boring, drilling and milling machine. The latter machine, which among other features was conspicuous for its size, weighs about 30,000 lb., has a cross travel of 72 in. and vertical travel of 40¼ in.

The 16A automatic surface grinder of the Blanchard Machine Co., Cambridge, Mass., which was in operation grinding double-end wrenches, was a center of interest. The machine was equipped with an automatic sizing device and a washing tank attachment into which the work drops after being ground and through which it is conveyed automatically and dumped into a tote box or other receptacle. A vertical spindle surface grinder, the No. 33, of the Abrasive Machine Co., East Providence, R. I., was also under power, as well as the company's No. 3 horizontal spindle surface grinder, both machines being equipped with magnetic chucks. The Thompson Grinder Co., Springfield, Ohio, exhibited a 10 x 36 in. universal grinder which is a self-contained unit. The motor and countershaft are mounted on a three-point supported overhead frame, with all controls conveniently placed.

Disk grinder shown by the Badger Tool Co., Beloit, Wis., included the No. 8 belt-driven machine in which the rocking of the table and holding the work against the wheel are done automatically by power. A No. 22 motor-driven grinder of built-in type and with automatic features was in operation grinding push rods, the production of which was 30 per min. The Production Machine Co., Greenfield, Mass., had a surfacing and polishing machine for finishing flat work 1/16 to 4 in. thick, up to 5½ in. wide and up to 2 ft. long. Its polishing machine with centerless feed for cylindrical work was also shown, and a type R disk grinder, surfacer, burring and polishing machine, a four-purpose unit was a feature.

Two Kobert electric forging and riveting machines of the National Equipment Co., Springfield, Mass., attracted attention. These machines are self-contained and are intended to accurately and economically set rivets hot and upset parts of certain size to practically finished dimensions. One, the type N.C., was in operation forging the head and stems of automobile valves at the rate of 4 per min., and the other, the N.B. machine, was riveting pliers at the rate of 15 to 20 pair per min. The machines may be used for operations on rods from less than ⅛ in. up to bars ¾ in. in diameter.

A high-speed press with armature disk notching attachment operating at 600 strokes of slide per min. was a feature of the exhibit of the V & O Press Co., Hudson, N. Y. An inclinable press, equipped with double roll feed and scrap cutter, was also in operation.

New Open-Side Planer

An outstanding exhibit in the space of the Strong, Carlisle & Hammond Co., Cleveland, which showed 37 machines of 15 manufacturers, was a new open-side planer recently developed by the G. A. Gray Co., Cincinnati. The features of this machine, which was 36 x 36 in. by 10 ft. in size, will be outlined in a forthcoming issue.

The Brown & Sharpe Mfg. Co., Providence, had four machines in operation, including the No. 3-A universal milling machine with motor in the base drive, a No. 33 automatic milling machine; a No. 44 spur and helical gear hobber and a No. OG automatic screw machine equipped with high-speed spindle. There was also a large and attractive display of precision tools and cutters, including a new direct reading micrometer, readings in thousandths of an inch being obtained directly from dials on the tool.

Another large exhibit was that of the American Tool Works Co., Cincinnati, which had in operation a 14 in. by 6 ft. engine lathe, a 24 in. by 12 ft. heavy-pattern lathe and a 24-in. shaper, all motor driven. A 5-ft. triple-purpose plain radial drill with motor on the arm was on view, as well as a 3-ft. maxi-speed sensitive radial recently brought out.

Automatic drilling and tapping equipment of the National Automatic Tool Co., Richmond, Ind., included a new tapper designated as the No. C 13-A. A No. C 13-C driller was shown and also a No. 2 SS Garvin horizontal duplex driller and a No. 9 Minster Hi-Duty driller. A feature was the No. A-103 continuous driller, which is a high-speed production machine for small parts. The machine is of the rotating type, six heads carrying the spindles, revolving continuously with the work table on which the fixtures are mounted. Drill heads may be mounted on each spindle and several holes drilled in work at each station. Subsequent operations, such as drilling, reaming or counterboring, may be done in successive stations.

Other drilling machines in this space included a four-spindle ball-bearing power-feed drilling machine of the Charles G. Allen Co., Barre, Mass., set up drilling part of Gabriel snubbers and another four-spindle unit equipped with high-speed head, tapping head, hand and power feed respectively. The high-speed head is new and is for light drilling up to 10,000 r.p.m. It may be used in combination with spindles running at an ordinary rate of speed, the work being put in a jig to drill or counterbore a hole at 350 r.p.m. or less, and then drilling another hole at 10,000 r.p.m. without removing the work from the jig. A one-column and base radial drilling machine with friction tapping attachment, a radial stud driver and setter and a cabinet base polishing and buffing machine were exhibited by the Hammond Mfg. Co., Cleveland.

Production Drilling Machine

Milling machines known as Pro-Ducto-Matics, for high production work were shown by the Bilton Machine Tool Co., Bridgeport. The machine is designed for a variety of milling operations, such as squaring, hexing or octagon, straddle-milling, slabbing, grooving, keywaving, cross milling, etc., on castings, forgings, bars or tubes, and fixtures can be designed to hold any shape. The No. 7½ size was shown, one with the work fixture rotating in a horizontal plane and one with the work fixture in a vertical plane. The first machine, with horizontal turret, was straddle milling the ends of 5/16 in. automobile brake rod yokes at the rate of 1080 pieces an hour. The flat turret unit was equipped with fixtures for four different jobs.

(*Continued on page* 932)

General View of the Main Portion of the Exposition. The machine tools were in the basement

Mechanical Engineers Hold Shop Practice Session at Cleveland

Automatic die making machines and surface grinding were among the topics discussed at a machine shop practice session held under the auspices of the American Society of Mechanical Engineers at the Hollenden Hotel, Cleveland, Sept. 17, concurrently with the seventh annual convention and exposition of the American Society for Steel Treating. At the same meeting W. H. Rastall, chief of the industrial machinery division of the Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, spoke on the subject of "The Steel Missionary." Col. E. C. Peck, works manager of the Cleveland Twist Drill Co., Cleveland, presided.

The development of automatic die making machinery was outlined by S. A. Keller, Keller Mechanical Engineering Corporation, Brooklyn, N. Y., in a paper on the "Use of Machinery in Making Dies for Sheet Metal Work and Forging," which was read by John S. Shaw, chief engineer of the Keller company. The earliest application of automatic die cutting was to ornamental work, such as medals, jewelry, silverware, etc., a machine for this work having been brought out about 30 years ago. It was a reducing machine requiring the use of a model much larger than the die to be cut. The automatic duplicating die sinking machine, which came next, was described as an important development, but it required a master of hardened steel or hard bronze, and in many cases this was prohibitive. This was overcome some years ago by the development of electric tracer control, by means of which the tracer pressure is reduced to a few ounces, regardless of the work performed by the cutter. The use of masters of cement, plaster, lead or wood was thereby practicable and the usefulness of the duplicating die cutting machine greatly enlarged. Applications of the Keller automatic machines were shown by lantern slides.

The second paper, by Henry K. Spencer, general manager, Blanchard Machine Co., Cambridge, Mass., dealt with recent developments in surface grinding machines using the cup type of wheel, reference being made particularly to the Blanchard grinder. The developments were considered along two different lines, one of which has extended the field of the process to large pieces, and the other in reducing the cost of surface grinding small parts. What was said probably to be the largest vertical spindle surface grinder built, the Blanchard special 27-R, the wheel head of which weighs 3½ tons and carries either a 60 or 80-hp. motor directly on the spindles, was briefly described, this grinder being intended for the accurate machining of large pieces. Limits of plus or minus 0.001 in. were found to be maintained, the sides of large pieces being ground parallel to within 0.001 in. The wet grinding of hardened high speed or other steel was discussed, a case being cited of grinding both sides of 20 wood planing knives in one-half hour to limits of plus or minus 0.001 in. The construction and application of the company's automatic surface grinder was described and illustrated by lantern slides. This machine is for small parts made in large quantities and which have flat surfaces to be machined. It is for removing of not more than the following amounts of metal per surface: Hardened alloy steel, 0.008 to 0,012 in.; case hardened steel, 0.010 to 0.015 in.; soft steel and cast iron, 0.020 to 0.30 in., and brass, 1/16 in.

A. A. Wood, assistant sales manager, Diamond Machine Co., Providence, in a brief discussion following the presentation of Mr. Spencer's paper, outlined the advantages of grinding wheels of the segmental type.

In his address on "The Steel Missionary" Mr. Rastall spoke of the higher standard of living made possible by the achievements in the steel and machinery industries, and of the higher standards of Asiatic and other countries because of the absorption of our industrial processes.

Plan to Improve Basis of Bidding on Steel Structures

Structural steel engineers and fabricators met Sept. 28 at headquarters of the Structural Steel Board of Trade, 100 East Forty-fifth Street, New York, to discuss the resolution recently adopted by the steel fabricators' organization providing that only lump sum bids shall be submitted on building contracts in the New York district on and after Nov. 1. At the conclusion of the discussion a committee of three fabricators and three structural engineers was appointed by the chairman, Charles Eidlitz, and this committee will hold a meeting next Monday afternoon at the same place to devise ways and means of putting the new method of quoting on steel structures into effect.

The committee consists of H. G. Balcom, consulting engineer, 10 East Forty-seventh Street, chairman; S. F. Holtsman, Gunvald Aus Co., 244 Madison Avenue; C. J. Jeppesen, consulting engineer, 49 West Forty-fifth Street; J. Lewis Hay, Hay Foundry & Iron Works; William A. Garrigues, Levering & Garrigues Co.; Jacob Loewenstein, Taylor-Fichter Steel Construction Co., all of New York.

At the outset of the meeting considerable opposition to the plan of the Structural Steel Board of Trade developed among the structural engineers because of the insistence of the fabricators that they be furnished with completely dimensioned plans in being asked to bid on steel structures. In the discussion, however, it developed that the fabricators will be satisfied with what they termed "reasonably complete plans," or, in others words, plans containing sufficient information to enable them to bid intelligently.

It was pointed out by two or three of the structural engineers that peculiar conditions exist in the New York building situation, which frequently make it necessary to obtain bids on a pound basis rather than on a lump sum basis. Haste in getting construction work started was cited as one reason for asking for bids before plans have been completed. The fact that the renting season for office buildings ends with May 1 and for apartment buildings on Oct. 1 makes haste necessary, it was stated, in getting work under way and two to four weeks can sometimes be saved by getting steel bids before complete plans are available. High land values in New York also make haste necessary, as owners do not desire to have idle property on their hands very long.

On behalf of the fabricators it was stated that pound prices create a bad competitive situation in that owners and general contractors have a definite figure in their minds applying to one type of building and expect fabricators to meet this price even on buildings of a different type embodying considerably more shop and erecting labor. Furthermore, if a pound price is put in the owner expects any extras to be billed at the same pound price, and fabricators claim that it is the extras that cost money, sometimes up to 15c. a lb.

The discussion developed a spirit of compromise, and it seemed apparent that the differences in point of view which existed would be composed by the special committee which is to meet next week. The fabricators point out that their business lives are threatened by conditions prevailing in New York, but which do not exist in other building centers, and they propose to eradicate if possible the objectionable features of the steel building situation.

Consolidation of Atlas Steel Plants

The entire operating equipment of the Ann Arbor, Mich., plant of the Atlas Alloy Steel Corporation has been brought to Dunkirk, N. Y., and is being installed in the local plant. The removal will not necessitate the erection of any new buildings, as two of the present buildings which are not in use will be utilized. The equipment consists of drop forge hammers, presses and other machinery. Five of the department heads from the dismantled Ann Arbor plant have been moved to Dunkirk, including Carl Anderson, superintendent.

Electric Furnaces and Ferroalloys

Discussed by American Electrochemists at Chattanooga Meeting Last Week—Electrolytic Steel Corrosion

THE American Electrochemical Society held its forty-eighth general meeting at Chattanooga, Tenn., and Muscle Shoals, Ala., which were chosen on account of the recent important power developments of that region. Paul J. Kruesi of the Southern Ferroalloys Co. was chairman of the local committee. The main symposium was devoted to "The Relation of the Electrochemical Industry to the Production of Plant Fertilizers."

Ferrophosphorus from Electric Furnaces

Dr. K. D. Jakob, of the Bureau of Soils, Washington, presented, as one of the papers of this symposium, an excellent review of the phosphatic fertilizer industry paying particular attention to the "Development of Volatilization Methods for the Manufacture of Phosphoric Acid." He said, in part:

Elemental phosphorus has been produced commercially for many years by heating mixtures of bone ash, or phosphate rock, and carbon, with or without the addition of silica, to high temperatures in a reducing atmosphere. Ross, Carothers, and Merz of the Bureau of Soils conceived the idea of using the Cottrell precipitator for the recovery of the volatilized phosphorus pentoxide.

The electric furnace process, with the modification of adding iron to the charge is now being used on a large scale by the Federal Phosphorus Co. at its Anniston, Ala., plant. Practically the entire output of the plant is sold to food product manufacturers and for industrial uses. However, some concentrated fertilizer materials are being produced at prices which give promise of soon competing with the ordinary materials now on the market. It is reported that a large portion of the phosphoric acid, used in this country for industrial and food purposes, is produced at the Anniston plant. The by-product is ferrophosphorus which is used largely by producers of steel sheets.

Round Table Discussion on Ferroalloys

Robert Turnbull of Niagara Falls, N. Y., presided at a round table discussion on electric ferroalloys held Friday noon. It was a particularly interesting session. Present methods of producing ferrovanadium and ferrochromium were brought up but the main part of the discussion was devoted to ferrosilicon. As in the past the understanding is that the details revealed at these sessions be not reported. It is possible therefore merely to state in general, that there is still some difference of opinion whether finely divided or lump ferrosilicon is most suitable as an addition to the molten steel; that the granulation of ferrosilicon is usually due to certain impurities, notably calcium and phosphorus, and that blast furnace production of high grade ferrosilicon, even with enriched blast, is not to be recommended.

Among those who participated in the discussion were Dr. B. D. Saklatwalla and N. Petinot, Vanadium Corporation of America; Frederick M. Becket, president of the American Electrochemical Society and vice-president of the Electrometallurgical Co., New York; Louis F. Vogt, Standard Chemical Co.; Dr. Colin G. Fink, Columbia University; James Kelleher, Fitzgerald Laboratories, Niagara Falls; G. L. Davison, Southern Ferroalloys Co., Chattanooga; Frank H. Lamb, president Lamb Machine Co., O. Hutchins, Carborundum Co., Niagara Falls, and Oliver W. Storey of the Burgess Laboratories, Madison, Wis.

Electric Furnace Plants Visited

After the round table luncheon the electrochemists had an opportunity to see an electric ferrosilicon furnace in operation at the plant of the Southern Ferroalloys Co. Ferrosicilon in grades 10 to 50 per cent are here produced. The handling of raw materials and product are most efficient. The furnaces are of the Fitzgerald, open top design. Automatic electric regulators insure uniform heat and furnace operation.

Another plant visited was that of the Ross-Meehan Co., producers of "Meehanite," a specially heat-treated cast iron. A 3-ton Moore electric furnace is installed for making electric steel castings. Mr. Meehan, president of the company, conducted the party through the foundries.

At the Chattanooga Stamping & Enameling Co.'s plant an electric enameling furnace is in operation. The company produces enameled iron both as sheet and castings. Great care is taken in the preparation of the enameling mixture and its uniform application to the iron or steel surface.

A Double Current Electrolytic Furnace

Profs. Henry K. McIntyre and George C. Cox of North Carolina State College reported upon results obtained with a new type of electric furnace employing both direct and alternating current. They said in part:

The electrolytic principle of the aluminum cell is combined with the heating principle of a slag resistor furnace. Direct current is fed in between vertical electrodes, and the heating or alternating current is fed in between horizontally placed electrodes. Electrolyzing bauxite-fluoride solutions in this furnace produced aluminum metal readily at a d. c. voltage ranging between 4.5 and 6 volts. A charge of garnierite yielded a silicon-iron-nickel complex containing 40 per cent nickel. Malachite could be more readily reduced in this double current furnace than in a corresponding a. c. furnace. When treating mixtures of malachite and hematite a fair separation was obtained, the cathode product containing 90 per cent copper.

The novel feature of this furnace is the method of introducing direct and alternating current through two entirely independent sets of electrodes, in such a manner that there is no leakage or interference between them. Such leakage and interference occur in the Hauss furnace, an electric furnace in which the cathode is burdened with double duty, as cathode and as one of the alternating current electrodes. A separation of the control of the heating and electrolyzing energy is easily obtained, enabling separation of the various ores into their component metals at the optimum voltages and temperatures. A lessening of the anode effect is notable.

In the discussion that followed, Dr. Carl Hering of Philadelphia, well known induction furnace expert, felt that the idea could not be carried out commercially on a large scale. Dr. Francis C. Frary, director of the research laboratory Aluminum Co. of America, concurred with Dr. Hering and described tests that his company had carried out. On the other hand, Dr. Becket felt that the scheme ought to be further developed as it would be very valuable in bringing about selective electrolysis in the molten mass.

Miscellaneous Papers

Dr. George M. Enos of the University of Cincinnati presented a short paper on the "Plating of Chromium on Steel." He found that steel can be chromium plated by the methods described by Schwartz, but recommends that the temperature of the solution be kept low. For periods up to 6 hr., and temperatures up to 1050 deg. C., no combination of chromium plating, heat treating for diffusion, and case hardening could be found that would give surfaces which were hard, and at the same time in such physical shape as to make it likely that they would resist corrosive media. Chromium plate on steel prevents cementation for the ordinary time and temperature conditions employed in case hardening.

J. R. Cain and A. A. Peterson, Bureau of Standards, have constructed a special furnace which they described under the title, a "Laboratory High Frequency Furnace." It is claimed to eliminate sources of contamination met with in carbon resistor type vacuum furnaces. The furnace is operated inside an evacuated glass bell jar; the base plate is bakelite; crucibles are made of magnesia or zircon. The melting coil and the high frequency generator are of the Ajax-Northrup design.

John A. Seede, General Electric Co., Schenectady,

N. Y., stated that the Ajax Electrothermic Corporation has developed two small furnaces, one a 250-watt and the other a 1500-watt high frequency furnace. These furnaces are very convenient for laboratory work and ideal for iron and steel research. Secretary Fink read a letter received from Prof. Johannes Härden of Stockholm, Sweden. Professor Härden found that, if the pressure of his vacuum furnace was lowered to about 0.5 or 1 mm. mercury, a heavy Geissler discharge set in, lowering the heating effect on the melt considerably. Another difficulty he encountered was the formation of a kind of a roof of a part of the charge above the actual melt, so that the upper portion, from 6 to 10 per cent of the whole, does not mix with the rest of the melt. Dr. Fink retorted that this latter "roofing over" difficulty could be eliminated by change in electrical design of coil and proper control of speed in heating.

Electrochemical Corrosion

"The Electrochemical Corrosion of Iron and Steel" was the title of a manuscript received from H. Beeny, master of metallurgy, Sheffield, England. A brief abstract follows:

Tests were undertaken to determine the influence of manganese on the corrosion of a large number of hypoeutectoid steel samples. The method proposed by Desch and Whyte, using a 5 per cent NaCl solution and a platinum cathode, was first tried but results were not satisfactory, due largely to a rapid polarization of the platinum electrode. Accordingly, a new apparatus was devised using a gold cathode, in place of the platinum one, with an immersed surface 40 times that of the polished steel specimen which was made anode. Cathode polarization was thus minimized. The electrolyte was 0.2 per cent sodium chloride solution. The progress of corrosion was observed through the microscope. The quantity of electricity liberated by the corrosive reaction itself was measured electrically and also analytically. The two values check, indicating "beyond all doubt that the corrosion has been entirely electrochemical." The whole of the iron corroded entered solution in the ionic condition. Experiments were then made to determine the effect of varying the quantity of air (oxygen) in solution upon the rate of corrosion. Results indicate that the "purely chemical" effect either does not exist at all, or is extremely slow and unimportant compared with the electrochemical corrosion reaction. A further improvement in the apparatus was made by rapidly rotating the gold cathode, and thus reducing the effect of cathode polarization by hydrogen still further. Manganese sulfide appears to stimulate local corrosion. Manganese as carbide, and in solid solution, has little or no action upon the corrodibility of the metal. Microphotographs of the corroded areas were shown and discussed. The inevitable conclusion is that atmospheric corrosion is fundamentally electrochemical.

Discussing Beeny's findings, H. S. George, Union Carbide & Carbon Co., and likewise Dr. Frary of the Aluminum Co., referred to differences in corrosion that would occur when a plug, screwed into a sample of steel, was not of identical composition, or of identical strain hardness, particularly at the junction of the two. F. N. Speller of the National Tube Co., Pittsburgh, cautioned the audience against too hasty conclusions as to the direct similarity between forced electrolytic corrosion and ordinary atmospheric corrosion. Tests made by the A. S. T. M. committees indicate that there is no direct relation between continuous immersion tests in water, not agitated, and corrosion in the air. Dr. Fink favored the electrolytic test and considered it very valuable but stated that according to his experience, it was essential to use very small current densities and very weak electrolytes. Furthermore, he has found that tests must not be confined to one electrolyte. Experiments carried out at Columbia University this summer indicate that there is a very close relation between atmospheric corrosion and the forced electrolytic corrosion.

The Bureau of Standards investigated the "Protective Value of Nickel Plating" on the corrosion of steel. The investigation was carried out by C. T. Thomas and William Blum, of the Bureau. The results indicate that all nickel coatings are porous and that the only practical method of increasing the protective value of the nickel plate is by the use of heavy plates, one mil thick and over. A very lively discussion ensued, the main bone of contention being the actual cause of the pits.

The spring meeting of the American Electrochemical Society will be held at Chicago, April 22, 23 and 24, 1926.

New York Steel Treaters' Winter Program

A unique and interesting program has been prepared by the program committee of the New York Chapter of the American Society for Steel Treating for the meetings during the coming fall and winter. It will consist of talks and round table discussions on the "Manufacture and Use of Steel."

At the first meeting which was held Wednesday evening, Sept. 23, steel melting was the subject of discussion which was opened by Radclyffe Furness, superintendent melting and forging department, the Midvale Co., Philadelphia.

Subjects for future meetings, held usually on the third Wednesday of each month, are as follows: The manufacture of ferroalloys, round table discussions on alloy steels, flow of metals in forging, testing of treated steels, alloy steels in machine tools, alloy steels in automobiles.

The date for the annual smoker has been set for March 17, 1926.

Plans Concluded for New Electrical Plant

Marvin A. Neeland, president New York Shipbuilding Corporation, and Laurence R. Wilder, president Wilder Electric Trusts, Inc., have returned from Switzerland, where they concluded arrangements for the acquisition of the plant of the New York Shipbuilding Corporation at Camden, N. J., by the Swiss electrical manufacturing firm of Brown, Boveri & Co. The announcement of the negotiations was first published in THE IRON AGE, Aug. 13, page 412.

An American company will be formed, to be known as the American Brown, Boveri Co. and a transfer of stock will be effected whereby shares in the new company will be exchanged for those of the New York Shipbuilding Corporation. The financial details will probably be announced shortly.

According to Mr. Neeland, the plant of the shipbuilding company has been found almost ideal for the manufacturing of electrical equipment. Many of the machines now installed there can be utilized in the building of electrical machinery. While minor changes in shop equipment will be necessary, these can be effected speedily and the American Brown, Boveri Co. will be in production in this country within a comparatively short time.

Steel Treaters Take Up Hardness Testing

The hardness testing committee of the American Society for Steel Treating held an important meeting during the annual convention in Cleveland during the week of Sept. 14. At a luncheon Friday, Sept. 18, plans were laid to institute and finance a study to find a commercial method of determining the hardness of thin sheet and sections too small for the present hardness testing machines. It was decided to draw up a detailed program with specific recommendations which will be laid before the board of directors of the society at their next meeting.

Work on the general subject of hardness testing is understood to have been semi-dormant for several years. Last year, however, at the request of the National Research Council the steel treaters' organization was asked to reorganize the committee and rapid progress is being made.

CUT GRINDING WHEEL SIZES

Conference Votes to Eliminate 459,000 Stock Numbers by Jan. 1

WASHINGTON, Sept. 29.—Estimating an annual saving of $5,000,000 to manufacturers, distributers and users, a general conference of these interests on Wednesday of last week voted to eliminate 459,400 stock sizes of grinding wheels, reducing the number from 715,200 to 255,800. The conference was held under the auspices of the Division of Simplified Practice, Department of Commerce, and accepted without change the agenda which had been prepared as the result of a survey extending over several years made by the grinding wheel industry through a committee on simplification, the program being presented by George W. Chormann of the Carborundum Co., Niagara Falls, N. Y., who represented the Grinding Wheel Manufacturers' Association of the United States and Canada.

It was explained by Mr. Chormann that the program of the committee also favored the elimination of six of the nine sizes of arbor holes for wheels from 10 to 26 in. in diameter, retaining only the 5, 8 and 12-in. sizes. The program applicable for one year is to become effective Jan. 1, 1926, and existing stocks are to be cleared by July 1, 1926.

Mr. Chormann pointed out that the simplifications covered only six types of wheels, internal, cylinder, straight cups, flaring cups, dish wheels, and double cups, which now exist in 414 shapes. In these types the existing types and proposed reductions follow:

Type	No. of Existing Shapes	Possible Stocks	Reduced To	Reduced Stocks	Possible Stock Saving
Internal	289	578.000	95	190,000	388,000
Cylinder	45	90,000	26	52,000	38,000
Straight cups...	11	4,400	5	2.000	2,400
Flaring cups...	27	10,800	8	3,200	6,600
Dish wheels....	38	30,400	9	7,200	23,200
Double cups....	4	1,600	1	400	1,200
	414	715,200	144	255,800	459,400

Existing grits and grades, it was stated, will not be interfered with by the program, but it was announced that steps are being taken by a committee on grading of the Grinding Wheel Manufacturers' Association to develop a chart which will show the comparative grades as between the products of different manufacturers for the same type of work. This proposed chart will be a guide to the consumer.

The effective date of the program will give sufficient time to avoid scrapping of existing machinery for the new production, it was stated. Some concern as to the scrapping of machinery had been expressed until it was made clear by E. W. Ely, acting chief of the simplified practice division, that there would be no danger of such a situation. He said that sizes which are not carried in the program can still be ordered if necessary. Alvin M. Smith of the Southern Supply and Machinery Dealers' Association, Richmond, Va., said that the association is much interested in the amount of stock carried, and that it wants to supply demand, but favors the program to "the extreme limit."

The conference voted that for the purpose of observing the application of the recommendations and for gathering material for any needed revisions there should be a standing committee of eight members, two each from the wheel manufacturers, the grinding machine manufacturers, distributors and consumers. Meanwhile, it was indicated, further steps would be taken to develop simplified practice programs for other classes of grinding wheels and that also technical and scientific problems would be studied. The program will be brought to the attention of the builders of grinding wheel machinery both to obtain full cooperation in the simplification and to devise means of adapting existing machinery to the use of simplified sizes.

The attendance included the following:

William Althoff, Department of Commerce; James I. Baker, Safety Emery Wheel Co., Springfield, Ohio; L. L. Byers, Abrasive Co., Philadelphia; L. W. Chaney, U. S. Department of Labor; George W. Chormann, Carborundum Co., Niagara Falls, N. Y.; S. H. Finley, Timken Roller Bearing Co., Canton, Ohio; A. G. Follette, assistant chief general material superintendent, Pennsylvania Railroad, Philadelphia, also representing American Railway Association; Harry P. Gee, Dodge Brothers, Detroit; W. R. Moore, Norton Co., Worcester, Mass.; Charles F. Naas, Packard Motor Car Co., Detroit; F. C. Nichols, Federal Specifications Board; F. W. Smith, General Motors Corporation, Detroit; Alvin M. Smith, Southern Supply and Machinery Dealers Association, Richmond, Va.; Luther Becker, iron and steel division, Department of Commerce; W. H. Rastall, machinery division, Department of Commerce.

Open-Hearth Committee to Meet

The second meeting of the open-hearth committee of the American Institute of Mining and Metallurgical Engineers will be held at the Hotel Cleveland, Cleveland, Oct. 13, 14 and 15. Arrangements have been made for all open-hearth superintendents or the representatives of those companies attending the conference in Cleveland to visit the plants of the Youngstown Sheet & Tube Co. and the Republic Iron & Steel Co. This inspection trip will leave the Ohio Hotel, Youngstown, at 9 a.m., Oct. 12.

The program of the meeting in Cleveland follows:

Tuesday, Oct. 13, 10 a. m. Opening addresses by J. V. W. Reynders, president of the institute and Herbert M. Boylston, president of the Ohio section of the institute. This will be followed by the report and a discussion of the report of the committee on furnace design which consists of Kent Harrison, Donner Steel Co., chairman; R. J. Cain, Bourne-Fuller Steel Co.; Frank King, Weirton Steel Co.; Kenneth McCutcheon, American Rolling Mill Co.; J. R. Mountain, Trumbull Steel Co.

Wednesday, Oct. 14. Morning and afternoon session, devoted to the report and discussion of the findings of the committee on practice and yield. This committee consists of G. D. Tranter, American Rolling Mill Co., chairman; Mr. Kitto, Pittsburgh Steel Co.; A. W. Smith, Youngstown Sheet & Tube Co.; B. P. Wheeler, Bethlehem Steel Co.; R. L. Levantry, Republic Iron & Steel Co.; H. B. Hubbard, Inland Steel Co.

7 p. m. Dinner in conjunction with the Ohio section of the American Institute of Mining and Metallurgical Engineers at the Hotel Cleveland.

Thursday, Oct. 15. Report and discussion of report of the committee on refractories—G. V. Bole, U. S. Bureau of Mines, chairman; A. R. Maxwell, Pittsburgh Steel Co.; N. E. McCallum, Phoenix Iron Co.; M. C. Shannon, Gulf State Steel Co.

Foreign Trade Convention at Charleston

Charleston, S. C., is to have the thirteenth National Foreign Trade Convention. It will be held April 28 to 30, 1926, according to an announcement just made by Secretary O. K. Davis, India House, New York. Mr. Davis says this will be the first convention of the organization to be held in a South Atlantic port, and it is expected to take action looking to the development of Atlantic and South Atlantic trade with Central and South America, Europe and the Far East. The convention call points out that Charleston, Savannah and Jacksonville, now fifteenth, sixteenth and seventeenth cities in tonnage of imports into the United States, have shown the most concerted development of American foreign trade in recent years. Charleston has spent $11,000,000 on modern port terminals.

Struthers Furnace May Resume

YOUNGSTOWN, Sept. 29.—The final tonnage of pig iron purchased by Hickman, Williams & Co., Pittsburgh, from the receiver of the Struthers Furnace Co., Struthers, Ohio, as modified by sales made immediately prior to the purchase, was 36,477 tons. Of this total 18,561 tons was No. 2 foundry. Some consideration is being given by the receiver of the furnace company to a resumption of production during the fall, a decision depending upon the state of the market.

Continental Position Better

Belgium and France More Active—England Still in a Slump

(By Cablegram)

LONDON, ENGLAND, Sept. 28.

PIG iron is dull and easier. Continental competition in No. 3 foundry iron is keen and makers here are anxious for orders. Hematite is weak.

Foreign ore is quiet. Sellers of Bilbao Rubio ask 20s. ($4.84) c.i.f. Tees.

Demand for finished iron and steel has improved slightly, but plate and section mills are in want of orders. Sheet makers are well occupied up to the end of the year.

Manchester is proposing an underground railroad scheme (subway). The Indian Government has sanctioned authority to the Railway Board for its electrification scheme for the Great Indian Peninsular Railway.

Sheets and Tin Plate

Tin plate makers have not yet adopted the pooling scheme, but 85 per cent of the makers have agreed to it in principle and final adoption will, it is anticipated, be had at the full meeting on Tuesday. Meantime the market is firmer, with moderate business.

Galvanized sheets are quiet and steady. Makers are well placed.

Japanese demand for black sheets is moderate, with sales for shipment up to the new year.

On the Continent of Europe

Continental markets are slightly livelier, with sellers less inclined to grant concessions. Wire rod makers are well booked and ask £5 15s. ($27.83) f.o.b., for January shipment. Sheet bars are being sold at £4 14s. ($22.75) f.o.b. Small sized merchant bars are sold at £5 8s. (1.17c. per lb.) f.o.b.

Krupp interests have withdrawn from the proposed German steel trust.

In Germany at present only 100 blast furnaces are active.

British Iron and Steel Industry Facing a Lean Fall and Winter

LONDON, ENGLAND, Sept. 17.—Diminishing demand and falling prices form the story of iron and steel. There seems to be practically no confidence among users, either at home or abroad, in the stability of prices, with the result that buying is at a low ebb. Pig iron producers have reduced the output of the furnaces considerably, but still stocks generally are in excess of requirements and further concessions in prices do not bring in buyers. The Continental product competes fairly keenly, especially with consumers in the Scottish area, and in a lesser degree with users in South Wales, and some fair quantities have been coming in. The total amount of pig iron imported during the eight months of this year was over 191,000 tons, which is about 11,000 tons more than during January-August last year.

Imports of sheet and tin plate bars also have shown appreciable increases, the total for January-August being over 320,000 tons, whereas a year ago they were about 216,000 tons. The increase in the volume of sheet and tin plate bars purchased is due mainly to the break-up of the Tin Plate Stabilization Scheme and consequent free hand given to the tin plate mills in respect to their bar purchases. Many thousands of tons have been bought from Belgium, Luxemburg and France during the last few weeks, at prices about 20s. or more cheaper than the British product.

Shipbuilding, apart from government and one or two isolated orders, continues in a bad state, and while these conditions last steel manufacturers can barely hope for any substantial improvement in their order books. Generally speaking, the shipbuilding outlook for the winter is far from promising, the total unfilled orders in hand being well below the tonnage on the stocks. The decision of the Admiralty to close the

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British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.84 per £, as follows:

Durham coke, del'd..	£0 19s.			$4.60		
Bilbao Rubio ore†...	1 0½			4.96		
Cleveland No. 1 fdy.	3 11½			17.30		
Cleveland No. 3 fdy.	3 7½			16.34		
Cleveland No. 4 fdy.	3 6½			16.09		
Cleveland No. 4 forge	3 6			15.97		
Cleveland basic	3 7½			16.34		
East Coast mixed....	3 14½			18.03		
East Coast hematite	4 19			23.96		
Ferromanganese	15 10			75.02		
*Ferromanganese ...	15 5			73.81		
Rails, 60 lb. and up..	8 5	to £9	0s.	39.93	to	$43.56
Billets	6 5	to 7	15	30.25	to	37.51
Sheet and tin plate bars, Welsh ...	6 5			30.25		
Tin plates, base box..	0 19¼	to 0	19½	4.66	to	4.72
				C. per Lb.		
Ship plates	7 15	to 8	5	1.67	to	1.78
Boiler plates	11 10	to 12	0	2.48	to	2.59
Tees	8 0	to 8	10	1.73	to	1.84
Channels	7 5	to 7	15	1.57	to	1.67
Beams	7 0	to 7	10	1.51	to	1.62
Round bars, ⅜ to 3 in.	8 10	to 9	0	1.84	to	1.94
Steel hoops	10 15	and 12	10*	2.32	and	2.70*
Black sheets, 24 gage	11 5			2.43		
Black sheets, Japanese specifications	15 5			3.30		
Galv. sheets, 24 gage	16 5			3.51		
Cold rolled steel strip, 20 gage	18 0			3.89		

*Export price.
†Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

Foundry pig iron: (a)						
Belgium	£3 2s.	to	£3 3s.	$15.00	to	$15.24
France	3 2	to	3 3	15.00	to	15.24
Luxemburg	3 2	to	3 3	15.00	to	15.24
Basic pig iron: (a)						
Belgium	3 1	to	3 2	14.76	to	15.00
France	3 1	to	3 2	14.76	to	15.00
Luxemburg	3 1	to	3 2	14.76	to	15.00
Billets:						
Belgium	4 12½	to	4 13½	22.39	to	22.63
France	4 12½	to	4 13½	22.39	to	22.63
Merchant bars:				C. per Lb.		
Belgium	5 7			1.15		
Luxemburg	5 7			1.15		
France	5 7			1.15		
Joists (beams):						
Belgium	5 2½			1.11		
Luxemburg	5 2½			1.11		
France	5 2½			1.11		
Angles:						
Belgium	5 2½			1.11		
¼-in. plates:						
Belgium	6 15			1.46		
Germany	6 15			1.46		
⅜-in. ship plates:						
Luxemburg	6 4			1.34		
Belgium	6 4			1.34		

(a) Nominal.

Pembroke and Rosyth dockyards has caused a good deal of comment. In the merchant service there are at present only two really substantially-sized boats under construction, one a 10,000-ton motor liner for the Bibby Line and another, a Union-Castle liner, placed with Workman Clark & Co., Belfast.

ACTIVE BELGIAN EXPORTS

Iron and Steel Market Hit, However, by German Competition

BRUSSELS, BELGIUM, Sept. 18.—Although export business, favored by the low level of the Belgian franc, has become somewhat more active, the general situation of the market cannot be said to have substantially improved. The most satisfactory feature is the tendency of prices to more stability. Unfortunately, an accentuation of foreign competition, especially from Germany, has also been noted, at prices often below the Belgian quotations.

The pig iron market has become somewhat stronger, and foundry pig iron sells easily at 330 to 340 fr. ($14.67 to $15.10).

Billets are firmer. Bars and steel merchant products of various shapes are steadier at 585 fr. (1.16c. per lb.), and would have been better but for German competition.

Joists (beams), on the contrary, are weak, owing to the decrease of orders from the building trade. In sheets, the situation varies according to the class of product.

The slight improvement noted should not be taken as the sign of a definite revival of the market. It is caused partly by the restarting, after the recent strike, of metallurgical workshops. As to the ironworks that remain still on strike, more optimism is shown about a prompt termination of that dispute, for the inquiry on the wages question is nearing its completion.

GREATER FRENCH DEMAND

Export and Inland Orders—German Dumping and British Need for Sales Hampers

PARIS, FRANCE, Sept. 18.—Although it is difficult to characterize the situation in all sections of the market, we may, this week, note a certain seasonal increase in orders. On the export market are unsatisfied requirements, but there we are confronted with a growing competition due, among other causes, to the fact that, urged by the necessity of selling, British makers are lowering their prices and, on the other hand, to the determination of the Germans, for clearing excessive stocks, to make the necessary sacrifices on their export sales.

Iron Ore.—Inland demand is satisfactory; but that for export has decreased, owing to the Belgian strike and to the present inactivity of the British and German trades. All the contracts which the Briey mine owners had concluded with South Wales iron works have now come to an end and any new order that may be in sight, admitting it comes through, will certainly be small. Moreover, carrying expenses are now far too high to permit any serious hope of exporting French iron ore beyond the British Channel or the North Sea.

On the other hand Germany, where furnaces are one after the other put out of blast, thus reducing considerably her consumption of iron ore, cannot for the present be looked to by our ore producers. Prices quoted remain: 25 fr. ($1.20 per gross ton) for Briey minette holding 35 per cent of iron; and 30 fr. per ton ($1.45) for ore holding from 38 to 39 per cent of iron.

Pig Iron.—No change in the situation. French production of pig iron is rather increasing, but this increase does not concern foundry pig iron, but only basic and special pigs. Since the present "entente" was started, French consumers are used, at the beginning of each month, to apply to their customary producers for their requirements for the whole month. Thus after the first few days of each calendar month the market becomes quite inactive. Such ironworks as produce pig iron of repute have not one more ton to sell, while any little available tonnage still to be had can be obtained only from those other producers whose pig iron, wrongly or not, does not enjoy the same favor with consumers.

Inland prices fixed by the O. S. P. M. are strictly enforced; but, owing to competition, export prices are much lower: 325 to 340 Belgian francs ($14.45 to $15.10). The difference between the price for inland sales and the price for export, both at producing works, may sometimes exceed 75 fr. per ton.

Castings.—The following prices for steel castings were handed in recently at a public auction of the French State Railroads:

Pieces up to 2 kg. (4.4 lb.)	285 fr. per 100 kg.	(6.11c. per lb.)
Pieces from 2 to 10 kg....	249 fr.	(5.34c. per lb.)
Pieces from 10 to 40 kg...	206 fr.	(4.42c. per lb.)
Pieces above 40 kg. (88 lb.)	185 fr.	(3.97c. per lb.)

DENIES UNFAIR PRACTICES

Aluminum Co. of America Replies to Federal Trade Commission's Charges

WASHINGTON, Sept. 29.—The Federal Trade Commission has made public a complaint directed against the Aluminum Co. of America, together with the answer of the company, which denies the charges of violation of the Clayton laws prohibiting restraint of trade and monopolies, and of the Federal Trade Commission act relating to unfair methods of competition.

It is alleged in the complaint, that the company sells virgin sheet aluminum to manufacturing foundries at prices below the price to jobbing foundries and that some makers of automobile bodies are sold sheet aluminum at a lower price than the figure to other manufacturers. It is complained that this is done with the understanding that the so-called lower selling price is made on the condition that all the aluminum scrap coming from operations of these manufacturers is to be sold to the Aluminum Co. It is charged that the price of the scrap is fixed by the Aluminum Co. and approximates the actual cost of manufacture or is higher than the cost to the Aluminum Co. to make virgin aluminum and higher than prices to competing foundries. It is also claimed that the company transfers virgin aluminum metal to its agents or its subsidiaries at an arbitrary price below the cost of production and at less than it is sold to competitors and that it follows a similar policy with respect to sand castings.

In its reply the Aluminum Co. denies that as a result of its practices all the secondary aluminum has been removed from the market or that it is purchased for the purpose of creating a monopoly or to prevent competitors from securing scrap aluminum. It is stated that while the company may transfer primary aluminum to subsidiaries at arbitrary prices it is purely a matter of bookkeeping and is a customary and convenient way of handling such transactions on the books of a parent company and its subsidiaries. It is admitted that the company sometimes pays higher prices for certain qualities of scrap aluminum than it costs to manufacture primary aluminum.

The Aluminum Co., in its reply, states that it was compelled to build up a market and that since expiration of the patents there has been nothing to prevent any "person who so desired from engaging in the manufacture or fabrication of aluminum in the United States." Contrary to embarrassing others in the trade, the company says it has devoted its time to producing aluminum in quantities which the public needed and of the best quality that could be produced and has encouraged and aided others to embark in the fabrication and use of articles in which aluminum is the sole or a constitutent part.

"It has been its policy," the answer concludes, "to give to consumers of aluminum the lowest possible prices . . . and whatever complaints have been made as to respondent's prices and methods are largely, if not wholly, confined to middlemen who naturally have found their profits more or less interfered with by said policy of respondent."

Iron and Steel Markets

FURTHER EXPANSION

September Shows Gain in Orders and Output

Prospects for Increased Operation in Fourth Quarter—Exports Best in 20 Months

Casting up the September account, nearly all steel companies find that the month brought a gain in unfilled orders, also that their production both of pig iron and steel ingots was greater in the short month than in the 31 days of August.

As the industry enters upon the October quarter the expectation is more general than at any time in the past month that consumption in the immediate future will call for an increase upon the average rate of operations in the three months just ended. At the same time buyers have made no departure from the policy of carrying light stocks.

Preliminary figures gathered by THE IRON AGE show that the pig iron output of all the steel companies in the 30 days of September, estimated at 2,200,000 tons, was 30,000 tons more than in the 31 days of August. Thus the gain in daily rate was about 5 per cent, whereas the August gain over July was but 1.5 per cent.

The larger steel companies made a net gain of seven in active blast furnaces last month. Several additional furnaces are scheduled to start in October.

While no close estimate is yet possible, the Steel Corporation's unfilled orders as of Sept. 30 are expected to show some increase, after six months of declines. Sheet bar contracts for the fourth quarter are a factor in the increase.

In the case of the Bethlehem Steel Co., while August operations were down to 57 per cent, the average for September is 66 per cent and October schedules call for 75 per cent. This week the Steel Corporation's ingot production is between 78 and 80 per cent of capacity.

Gradually the uncertainty as to railroad demand is clearing. Producers emphasize the fact that the rail orders now coming on their books will call for enlarged operation and are not needed, as at times has been the case, to make up for declining demand in other lines.

The Buffalo and Chicago district rail mills will be active in October and to the end of the year on contracts recently taken or about to be closed. The New York Central will place 175,000 tons and the Florida East Coast has given a 25,000-ton order to the Tennessee company.

In Canada the Algoma and British Empire mills have started up on Canadian Pacific and other orders running above 60,000 tons.

In the railroad equipment field, the Louisville & Nashville bought 1250 cars and 32 locomotives and the Baltimore & Ohio, following a purchase of 1000 steel car bodies last week, placed orders for 1500 bodies and inquired for 1000 box cars. The Chesapeake & Ohio closed on 20 more locomotives on top of 50 ordered last week and purchased 100 caboose cars. Some of this late car business developed figures representing distinct concessions on the steel.

Including 75,000 tons for plate work for the Oakland, Cal., pipe line, fabricated steel bookings reported in the past week called for over 106,000 tons, almost twice the amount of the heaviest week in fully a year.

Deliveries from Pittsburgh on the Oakland plate contract will extend over six months. Chicago mills are figuring on 25,000 tons of plates for oil tank work soon to be let.

Some mills have better bar bookings than in many months and 2c. is a more common price on fourth quarter business. In contrast is the weakness in sheets and cold rolled steel bars.

Low river freights have made Cincinnati sharply competitive ground on wire nails.

Connellsville furnace coke at $3.75 did not attract buyers in the present pig iron situation and the spot market is now $3.50. The coal trade also is quieter, the efforts at labor disturbance failing signally.

Iron and steel exports in August were the heaviest in 20 months; exports of American machinery the greatest in over four years; shipments of agricultural machinery 42 per cent above the highest previous record.

Imports of finished steel products, on the other hand, fell off, being only about 16,000 tons in August, against 19,000 tons in July. European mills are evidently tiring of the losses they made on early 1925 shipments to American ports.

Export sales of tin plate have been on a good scale lately. Italy has taken 300,000 boxes and in the past week the Standard Oil Co. of New York closed for 190,000 boxes for its plants in India and China.

Pittsburgh

Bars Advance but Sheets, Cold Finished Steel and Primary Materials are Weaker

PITTSBURGH, Sept. 29.—The general demand for steel is good and yet manufacturers find it almost impossible to accumulate backlog tonnages. Buyers are demanding early deliveries and the manufacturer who wants a share of passing business is obliged to meet the requirements or see the business go to a competitor who will. September registered a good gain in total business over August, but because of the demand for prompt deliveries there was a corresponding speeding up in production, with the result that shipments and incoming business were substantially equal and only slight accumulations of orders were possible. This clearly illustrates the highly competitive situation that now exists among mills. With ample evidence that steel consumers are lightly supplied with steel, as is seen in the frequency of their purchases, to say nothing of the early delivery requirements, the procedure of a few years ago by manufacturers

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Sept. 29, 1925	Sept. 22, 1925	Sept. 1, 1925	Sept. 30, 1924
No. 2X, Philadelphia‡	$22.26	$22.26	$21.76	$21.76
No. 2, Valley furnace†	19.00	19.00	18.50	19.50
No. 2, Southern, Cin'ti†	23.05	23.05	22.55	21.55
No. 2, Birmingham, Ala.†	18.50	18.50	18.50	17.50
No. 2 foundry, Ch'go furn.*	21.50	21.50	20.50	20.50
Basic, del'd, eastern Pa.	21.00	21.00	20.50	20.00
Basic, Valley furnace	18.50	18.50	18.00	19.00
Valley Bessemer del'd P'gh	21.26	21.26	20.76	21.76
Malleable, Chicago furn.*	21.50	21.50	20.50	20.50
Malleable, Valley	19.00	19.00	18.50	19.50
Gray forge, Pittsburgh	20.26	20.26	19.76	20.76
L. S. charcoal, Chicago	29.04	29.04	29.04	29.04
Ferromanganese, furnace	115.00	115.00	115.00	95.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Bess. billets, Pittsburgh	35.00	35.00	35.00	36.00
O.-h. billets, Pittsburgh	35.00	35.00	35.00	36.00
O.-h. sheet bars, P'gh	35.00	35.00	35.00	37.00
Forging billets, base, P'gh	40.00	40.00	40.00	42.00
O.-h. billets, Phila	40.30	40.30	40.30	41.17
Wire rods, Pittsburgh	45.00	45.00	45.00	46.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	1.90	1.90	1.90	2.00
Light rails at mill	1.65	1.65	1.60	1.85
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.12	2.12	2.12	2.32
Iron bars, Chicago	1.90	1.90	1.90	2.10
Steel bars, Pittsburgh	**2.00**	1.90	1.90	2.00
Steel bars, Chicago	2.10	2.10	2.10	2.00
Steel bars, New York	**2.34**	2.24	2.24	2.34
Tank plates, Pittsburgh	1.80	1.80	1.80	1.80
Tank plates, Chicago	2.10	2.10	2.10	2.00
Tank plates, New York	*2.04*	2.09	2.14	1.94
Beams, Pittsburgh	1.90	1.90	1.90	2.00
Beams, Chicago	2.10	2.10	2.10	2.00
Beams, New York	2.24	2.24	2.24	2.24
Steel hoops, Pittsburgh	2.40	2.40	2.40	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	Sept. 29, 1925	Sept. 22, 1925	Sept. 1, 1925	Sept. 30, 1924
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	*3.10*	3.15	3.15	3.50
Sheets, black, No. 28, Chicago dist. mill	3.30	3.30	3.30	...
Sheets, galv., No. 28, P'gh	4.20	4.20	4.20	4.60
Sheets, galv., No. 28, Chicago dist. mill	4.35	4.35	4.35	...
Sheets, blue, 9 & 10, P'gh	2.25	2.25	2.25	2.70
Sheets, blue, 9 & 10, Chicago dist. mill	2.40	2.40	2.40	...
Wire nails, Pittsburgh	2.65	2.65	2.65	2.75
Wire nails, Chicago dist. mill	2.70	2.70	2.70	...
Plain wire, Pittsburgh	2.50	2.50	2.50	2.50
Plain wire, Chicago dist. mill	2.55	2.55	2.55	...
Barbed wire, galv., P'gh	3.35	3.35	3.35	3.45
Barbed wire, galv., Chicago dist. mill	3.40	3.40	3.40	...
Tin plate, 100 lb. box, P'gh	$5.50	$5.50	$5.50	$6.50
Old Material, Per Gross Ton:				
Heavy steel scrap, P'gh	*$18.00*	$18.50	$19.00	$18.00
Heavy steel scrap, Phila	17.00	17.00	17.00	17.00
Heavy steel scrap, Ch'go	16.00	16.00	16.75	16.50
No. 1 cast, Pittsburgh	*17.00*	17.50	17.50	18.00
No. 1 cast, Philadelphia	18.00	18.00	18.00	18.00
No. 1 cast, Ch'go (net ton)	17.75	17.75	18.00	18.00
No. 1 RR. wrot, Phila	18.00	18.00	17.50	19.00
No. 1 RR. wrot. Ch'go (net)	*14.50*	14.75	16.75	15.00
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	*$3.50*	$3.75	$3.40	$3.00
Foundry coke, prompt	4.25	4.25	4.00	4.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*14.62½*	14.87½	14.75	13.12½
Electrolytic copper, refinery	*14.12½*	14.50	14.37½	13.75
Zinc, St. Louis	7.82½	7.85	7.57½	6.15
Zinc, New York	*8.17½*	8.20	7.92½	6.50
Lead, St. Louis	9.25	9.25	9.50	7.80
Lead, New York	9.55	9.55	9.85	8.00
Tin (Straits), New York	**59.12½**	58.50	56.62½	48.25
Antimony (Asiatic), N. Y.	**17.25**	17.00	17.00	11.25

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

THE IRON AGE Composite Prices

Sept. 29, 1925, Finished Steel, 2.403c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

One week ago,	2.396c.
One month ago,	2.396c.
One year ago,	2.474c.
10-year pre-war average,	1.689c.

Sept. 29, 1925, Pig Iron, $19.63 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

One week ago,	$19.54
One month ago,	19.13
One year ago,	19.46
10-year pre-war average,	15.72

High				Low			
1923	1924	1925		1925	1924	1923
2.824c., April 24	2.789c., Jan. 15	2.560c., Jan. 6	Finished Steel	2.396c., Aug. 18	2.460c., Oct. 14	2.446c., Jan. 2
$30.86, March 20	$22.88, Feb. 26	$22.50, Jan. 13	Pig Iron	$18.96, July 7	$19.21, Nov. 3	$20.77, Nov. 20

would have been to defer putting on additional capacity in an effort to build up order books. But they generally realize that long range buying is not in vogue and none dares pass up prompt delivery business because of the fear that some other producer will meet the exaction. The month has brought an increase of about 7 per cent in ingot production in the Greater Pittsburgh district, as compared with August, and a gain of eight in the number of active blast furnaces.

Prices continue to move unevenly. Bars appear to have recovered from their recent decline, and even those regarded as preferred customers, have not been able to place new business at under 2c. base, Pittsburgh. An effort still is being made to stiffen prices of plates and shapes; on the other side of the picture is found renewed competition for sheet business and fresh weakness in prices, while frequent deviations in cold finished steel bars have found recognition in a reduction of $2 a ton in the regular market quotations. There are suggestions that nails are not firm at $2.65, base per keg Pittsburgh.

In the primary materials, the situation shows a weaker front and while pig iron prices are unchanged, there is the implication of lower prices in reports of business lost at these quotations. Scrap prices have weakened to the extent of about 50c. a ton and heavy melting steel now is $1 a ton below its recent high point. The last advance in furnace coke has been cancelled and

spot tonnages now are readily had at $3.50 per net ton at ovens as against $3.70 a week ago. Efforts of the mine union leaders to get the non-union miners to quit work have failed. Eastern demands for coke to replace hard coal are fewer and smaller than they have been, and there is not the demand there was recently for coke for heating purposes that provided an outlet for considerable furnace coke.

Pig Iron.—Real activity still is lacking. Outside of a purchase of 2000 tons of basic iron by an Allegheny Valley sheet maker, who paid the full price of $18.50, Valley furnace, and one lot of 500 tons of foundry iron at $19.50 for number 2X, Valley furnace, the sales have run entirely to lots of one or two carloads. There is no occasion to change prices this week, but in view of a number of reports that business has been lost at quotations, the market is better described as steady than as firm. A fair amount of business has been done in low phosphorus iron at delivered prices ranging from $29.26 to $29.50. Some fair-sized orders for charcoal iron also are reported at $32, furnace, for Southern iron. The Carnegie Steel Co. has lighted one of its Ohio furnaces at Youngstown since a week ago and has ordered on one of the Isabella furnaces at Pittsburgh. The Claire furnace, Reliance Coke & Furnace Co., Sharpsville, Pa., started up late last week and this and nearby districts now have 77 of a revised total of 133 blast furnaces in production.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$18.50
Bessemer	19.50
Gray forge	18.50
No. 2 foundry	19.00
No. 3 foundry	18.50
Malleable	19.00
Low phosphorus, copper free	$27.50 to 28.00

Ferroalloys.—Trading still is slow in this market, but prices are well maintained. A Wheeling district roll maker recently placed 200 tons of ferromanganese for delivery over the remainder of the year, the business going to an Eastern steel company at the full price of $115, Baltimore. Other sales have been mostly carload lots, with consumers showing little inclination to buy more than their immediate requirements. There is no real activity in spiegeleisen and 50 per cent ferrosilicon is moving much more heavily on old contracts than on fresh sales. Prices are given on page 927.

Semi-Finished Steel.—An appraisal of prices still is difficult because of the continued absence of open market transactions. Local mills still insist that the market is $35, Pittsburgh or Youngstown, on billets, slabs and sheet bars, but the only sale of consequence is one of 3000 tons of Bessemer billets, on which $35, Pittsburgh, is reported to have been obtained. Non-integrated producers, as a rule, are protected by regular sources of supply against their requirements and demands for finished products are neither so large nor so urgent as to compel additional purchases. Wire rods are moving steadily in small lots at regular quotations. There is no open market activity in skelp. No trouble is experienced by buyers in obtaining supplies at 1.90c. Prices are given on page 927.

Wire Products.—Business is regarded as good for this time of the year. Makers in this district have made slightly larger shipments this month than they did last month, one company reporting a gain of 12½ per cent. There is no disposition among either jobbers or manufacturing consumers to build up stocks and the gain in business over the past three months may be regarded as reflecting a heavier consumption, since all orders have been for prompt shipment. An analysis of orders discloses that manufacturers' wire has done better than other products. Prices are firm on plain wire, but only steady on nails, which are subject to some shading. Prices are given on page 926.

Rails and Track Supplies.—Good business still is a hope rather than an actuality. Standard rail business for several years has been in the replacement of existing trackage rather than in the building of new lines; for that reason, there is not much variation in the year-to-year needs, but as this year's requirements were a little below those of 1924, it is figured there will be a corresponding increase in 1926 purchases over those for this year. The same hope is expressed as to track accessories. Light rails are finding a fair inquiry, but actual business is no tax upon the country's productive capacity. Prices are given on page 926.

Tubular Goods.—Pipe-making capacity still is well engaged, but incoming business is not equaling shipments and the prospect is for some falling off in plant operations. A steady demand is noted for standard pipe, but the mills are not getting as much oil country goods business as a short time ago. A fair demand is noted for small tonnages of line pipe, and among recent orders was one for five miles of 18-in. and ten miles of 14-in. for the Hope Natural Gas Co., which was placed with a Youngstown maker. The favorable phase of the situation is that stocks in second hands are light and that any gain in consumption will find quick reflection in the demands upon the mills. Prices are regarded as fixtures, as is natural, since there has been no change for more than two and a half years. Boiler tube business is only fair and prices are no more than steady. Mechanical tubing still sells well. Discounts are given on page 926.

Sheets.—There is a very active market in full finished sheets for automobile bodies and some makers have so much business in sight that they are extending their delivery promises, one important producer claiming that the middle of November is as early as it now can guarantee shipments against new orders. The leading producer of cheap cars has had some difficulty, on account of a change in body design, in getting up to normal production, but other builders appear to be getting heavy orders and are not only ordering freely but pressing for deliveries. The happy situation in automobile body sheets does not extend to the other finishes. There is a steady demand, but very keen competition for passing business is noted in black sheets and 3.10c., base, Pittsburgh, which recently was regarded as the basis of only large and attractive orders (those carrying liberal extras) now is the common and prevailing price. Several mills do not seem to want galvanized sheet business at today's prices, which are claimed to be unprofitable, but they have black sheets to sell; hence the competition in that grade. Prices are given on page 926.

Tin Plate.—Business is tapering off as it usually does at this time of the year, but the decline is very gradual as the packing season has been longer than customary, on account of favorable weather and the lack of severe September frosts. The leading producer has enough business to maintain its present rate of production of about 80 per cent of capacity well over the remainder of the year. Pacific Coast business is on hand to engage capacity released through the completion of the requirements of other parts of the country.

Cold-Finished Steel Bars and Shafting.—Prices are sagging in the face of rather good demand. Lately, 2.40c., base, Pittsburgh, has become the common quotation on ordinary tonnages. Buying has been good, but not anticipatory and evidently has been no tax upon the country's productive capacity, since competition for business has been keen throughout the year and today's price compares with 2.80c. at the beginning of the year.

Hot-Rolled Flats.—Business in these lines holds up well, but there is no such demand that would make imperative night-and-day operation of the mills to keep abreast of it. A considerable percentage of capacity is working double turn, but much of it is working single turn and general production is about 70 per cent of capacity. Prices are firm and there are some suggestions of an advance in the next 30 or 45 days. Prices are given on page 926.

Cold-Rolled Strips.—The best demand for this product still is from the automotive industry and that industry is doing so well that its requirements are large. Makers claim no difficulty in securing 3.75c., base, Pittsburgh or Cleveland, but say there is little or no profit at that price. An advance will probably be attempted before the end of the year.

Steel and Iron Bars.—Prices below 2c. base, Pittsburgh, on steel bars have disappeared and that price now is as low as buyers ordinarily regarded as preferred customers have been able to place new business. Incoming business has been exceeding shipments and despite a high rate of mill engagement, most makers have order books of sufficient size to be able to take a stronger stand on prices. There is no change in iron bar prices. Demand is steady enough, but runs entirely to small lots. Prices are given on page 926.

Structural Material.—Mills here are still endeavoring to stiffen prices, but the steel fabricating companies are not responding very well because of the low prices that still rule on the worthwhile structural jobs. On structural business where the desire of the investor is for very early delivery, the fabricating companies are able to get fairly good prices, but on projects where the time element is less exacting, competition is as sharp as ever. It is in these projects that the tonnage is heavy. Plain material prices are given on page 926.

Plates.—Plates for a welded pipe installation at Oakland, Cal., 75,000 tons, to be fabricated by one company on the Atlantic Coast and one on the Pacific Coast, will be furnished by the local plate making subsidiary of the Steel Corporation. There is a fairly good business in miscellaneous tonnages of plates, but there is not enough business to give all makers a share and, while there is an effort to stiffen the market to a minimum of 1.85c. base Pittsburgh, the ruling quotation still is 1.80c. Prices are given on page 926.

Bolts, Nuts and Rivets.—Fourth quarter contracts for bolts and nuts are coming along steadily and current demands reach a fairly large aggregate, although buyers are showing no inclination to get away from close range buying. Prices are very steady. The situation in rivets still is very unsatisfactory, as consumers are sparing buyers and manufacturers in an endeavor to keep their plants going and their organizations intact, have been obliged to make very low prices to secure the necessary orders. Some action looking toward a more orderly situation appears likely. Prices and discounts are given on page 927.

Old Material.—The market here still is weak on the open-hearth grades. A number of consuming points still are closed to shipments and dealers lately have found themselves "long" of the market. To find a place to put the material, it has been necessary for them to cut prices further and the market now is quotable at $18 to $18.50 on heavy melting steel, a drop of $1 a ton from its most recent high point. An Ohio River steel maker has been able to secure considerable tonnage at the lower figure and also secured compressed sheets at $17 and bundled sheets at $16. This is the only notable activity the market lately has shown.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel	$18.00 to $18.50
No. 1 cast, cupola size	17.00 to 17.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	20.00 to 20.50
Compressed sheet steel	17.00 to 17.50
Bundled sheets, sides and ends	16.00 to 16.50
Railroad knuckles and couplers	21.00 to 21.50
Railroad coil and leaf springs	21.00 to 21.50
Low phosphorus blooms and billet ends	23.00 to 23.50
Low phosphorus plate and other material	21.50 to 22.00
Railroad malleable	18.50 to 19.00
Steel car axles	21.00 to 21.50
Cast iron wheels	17.00 to 17.50
Rolled steel wheels	21.00 to 21.50
Machine shop turnings	14.00 to 14.50
Short shoveling turnings	14.00 to 14.50
Sheet bar crops	19.00 to 19.50
Heavy steel axle turnings	17.00 to 17.50
Short mixed borings and turnings	13.50 to 14.00
Heavy breakable cast	15.00 to 15.50
Stove plate	13.50 to 14.00
Cast iron borings	14.00 to 14.50
No. 1 railroad wrought	14.50 to 15.00
No. 2 railroad wrought	18.00 to 18.50

Coke and Coal.—The last advance in furnace coke that carried the market to $3.75 per net ton at ovens, also appears to have carried the market beyond the price ideas of consumers. There has been a notable lessening in the demand for furnace coke for heating purposes from the East, and lately there has been no demand to speak about from pig iron producers. The result is that spot tonnages of furnace coke now are readily obtainable at $3.50, and that also was the price on contracts for October calling for two cars a day. Foundry coke takes the same price as a week ago, but the market is neither active nor firm at these levels. While there is a fairly good demand for coal, it is no strain upon the supply and prices are still low. The general coal and coke situation is much more tranquil than it was recently. Efforts of the union organizers to create trouble in non-union mines at Fairmont, W. Va., have failed dismally and the men of the Washington Coal & Coke Co., who recently walked out, have gone back to work without securing any advance in wages. Prices are given on page 927.

Canadian Scrap Dull—Canadian Pacific Buys Rails

An interesting feature in the iron and steel market in Canada is the announcement that the Algoma Steel Corporation, Sault Ste. Marie, Ont., has secured a large rail contract from the Canadian Pacific Railway. This order, while the actual tonnage has not been stated, is sufficiently large to keep the rail mill going for about two months. The rail mill will be started up in the immediate future, which will also mean the blowing in of a second blast furnace to supply the necessary iron.

Iron and steel scrap dealers are looking forward hopefully to better times in their industry and are buying more extensively for stock, but there is little or nothing to indicate a strong revival of business. Dealers' buying prices are as follows:

Gross Tons	Toronto	Montreal
Steel turnings	$9.50	$8.00
Machine shop turnings	9.50	8.00
Wrought pipe	7.00	8.00
Rails	11.00	12.00
No. 1 wrought scrap	12.00	13.00
Heavy melting steel	11.00	11.00
Steel axles	17.00	18.00
Axles, wrought iron	18.00	20.00
Net Tons		
Standard car wheels	15.00	14.00
Malleable scrap	13.00	13.00
Stove plate	13.00	13.00
No. 1 machinery cast	16.00	16.00

Marked Activity in Youngstown District

YOUNGSTOWN, Sept. 29.—In the Youngstown district, the iron and steel industry enters October with production schedules on the increase and capacity engaged at 85 per cent.

Independents are operating 42 of 52 open-hearth furnaces in the Mahoning Valley, with independent Bessemer capacity engaged at 80 per cent. Ingot production at the Ohio Works, Carnegie Steel Co., increases this week to 96 per cent, as compared with 85 per cent last week and 76 per cent two weeks ago. The Carnegie company has 14 of 15 open-hearth furnaces active at the Ohio Works.

Sheet makers in the Mahoning Valley have 118 mills scheduled this week, which likely represents the high mark of the year. For the first time in 1925, the Newton Steel Co. has its full complement of 20 mills at its works in Newton Falls, Trumbull county, under power, adding four units. At Niles, the Thomas Sheet Steel Co. has expanded from eight to 10 active mills of 12, while the Falcon Steel Co. and the Mahoning Valley Steel Co. are each operating eight mills, their complete group.

At its McDonald works in Trumbull county, the Carnegie company this week brings into production its new 10-in. band and shape mill. This addition gives the Carnegie company 19 bar mills in the Youngstown area, including seven at the McDonald plant and 12 at the Union Works, Youngstown.

Buy Woodworking Machinery Co.

The P. B. Yates Machine Co., Beloit, Wis., has consummated negotiations for the purchase of the business and assets of the American Woodworking Machinery Co., Rochester, N. Y.

Chicago

Large Rail Inquiries—Steel Output Gains —Pig Iron Active

CHICAGO, Sept. 29.—Inquiries for finished steel have been well maintained, thus making the third consecutive week of active demand. In fact, the volume of inquiry during the past three weeks has been greater than for any corresponding period so far this year. Bookings for September in the heavier products, such as plates, shapes and bars, were large and continued, as in the previous month, to run ahead of shipments. Structural material is in good demand for this time of the year, both the volume of fresh inquiries and the number of pending projects pointing to a sustained fall business. It is rather generally estimated that fully 25,000 tons of plates will be required in the near future for oil storage tank construction. Rail purchasing is still lacking, although a number of attractive inquiries are before the trade. Track fastenings have shown no great activity, although there is some current buying. Railroad equipment orders are more numerous, and it is estimated by the mills that 24,000 tons of plates, shapes and bars will be required for cars contracted for during the week.

Operations of the leading interest have increased slightly and are now reported to be at 78 per cent of ingot capacity. The foremost independent continues to operate at about 80 per cent. The trade seems to be satisfied with the volume of business emanating from the manufacturing field and a stronger market condition is believed to be dependent on the extent to which railroad buying expands. Warehouses report a good volume of business for September. The lighter shapes and bars are the most active commodities, with demand from widely diversified sources.

Pig iron sales during the past month were in good volume and will compare favorably with those of August. Scrap has again weakened and some grades have declined.

Pig Iron.—Southern iron has again advanced and is now quoted at $19.50 to $20, base Birmingham, or $25.51 to $26.01, Chicago, for all rail delivery. The barge and rail rate is $4.18. These prices apply on fourth quarter purchases. Other grades of pig iron remain steady at the advances made last week. Demand for foundry iron for fourth quarter is insistent and shipments during September will run well ahead of August. Business during the month has consisted largely of spot orders and will not show up so well as for the month of August. One melter has made inquiry for 5000 tons of Northern foundry for first quarter, and a Michigan user is inquiring for 5000 tons of malleable for the same delivery. Fourth quarter inquiries include 1500 tons of malleable for a Wisconsin foundry, 3000 tons of foundry for a Western railroad, 500 tons of 8 and 10 per cent silvery for a Wisconsin melter and 400 tons of 8 and 10 per cent for a Michigan user. One seller reports the distribution of 5000 tons of spot foundry iron among various melters.

Quotations on Northern foundry, high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards:

Northern No. 2 foundry, sil. 1.75 to 2.25	$21.50
Northern No. 1 foundry, sil. 2.25 to 2.75	22.00
Malleable, not over 2.25 sil.	21.50
High phosphorus	21.50
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (all rail)	$25.51 to 26.01
Southern No. 2 (barge and rail)	23.68 to 24.18
Low phos., sil. 1 to 2 per cent, copper free	31.10 to 31.60
Silvery sil. 8 per cent	31.79
Ferrosilicon, 14 to 16 per cent	45.25 to 45.75

Ferroalloys.—The market is comparatively quiet and prices remain unchanged.

We quote 80 per cent ferromanganese, $122.56, delivered; 50 per cent ferrosilicon for 1925 delivery, $85, delivered; spiegeleisen, 18 to 22 per cent, $39.76 to $40.04, delivered.

Plates.—Twelve thousand tons of plates, shapes and bars will be required for 1250 cars placed by the Louisville & Nashville. Distribution of this order was made as follows: 500 box cars to the Standard Tank Car Co.; 500 gondola cars to the Pressed Steel Car Co., and 250 flat cars to the Bethlehem Steel Co. Additional car contracts let during the week will call for another 12,000 tons of steel. The Palace Poultry Car Co. has placed 150 poultry cars with the Illinois Car & Mfg. Co. The Baltimore & Ohio, following closely upon its order for hopper car bodies, has now made inquiry for 1000 box cars. It is reported that the Montour Railroad will take figures on 500 gondola cars. Inquiry during the week for tank steel was unusually good and it is generally estimated that the tonnage pending for oil storage projects is in the neighborhood of 25,000 tons. The Stacey Brothers Gas Construction Co. will require 500 tons of steel for a gas holder to be erected at Hornell, N. Y. Individual inquiries and orders for gas holders during the past seven days have not been large, although they have been received in good number, and therefore the total steel involved will represent a substantial tonnage. All told plate bookings practically balance production and mill prices remain steady at 2.10c., Chicago.

The mill quotation is 2.10c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Bars.—Demand for steel bars has been well maintained and as a result deliveries tend to extend still further. Farm implement makers are operating at approximately 80 per cent and the automobile industry is still very active. Sales of reinforcing steel are still heavy and pending projects bulk large in the aggregate. Soft steel bars are steady at 2.10c., Chicago. Bar iron mills have not been able to build up a backlog because of the general lack of interest in their product. Prices remain fairly steady at 1.90c. to 2c., Chicago. Rail steel bar mills have not slackened the pace which they maintained during the first three weeks of September. Rail steel bars are firm at 2c., Chicago.

Mill prices are: Mild steel bars, 2.10c.; common bar iron, 1.90c. to 2c., Chicago; rail steel bars, 2c., Chicago, and 2c., mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.60c. for rounds and hexagons and 4.10c. for flats and squares; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.60c.

Wire Products.—Jobbers, apparently anticipating an improved fall trade, have specified a little more freely during the past week. Demand for wire products is general, emanating from a wide range of sources and from practically all parts of the country. There has been no noticeable change in the level of mill stocks. Both in contracts and specifications, September will compare favorably with any other month so far this year. Mill prices, which remain steady, are shown on page 926.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed wire, $3.05 per 100 lb; common wire nails, $3.15 per keg; cement coated nails, $2.15 to $2.20.

Rails and Track Supplies.—Rail bookings during the week in this district were very light, but several inquiries are out which are attracting the attention of producers. One of these, which has been particularly active, is that of the Chicago & North Western, which is now said to call for a total of 36,000 tons. Other inquiries before the trade are 175,000 tons for the New York Central, 30,000 tons for the Chesapeake & Ohio and tonnage for the Chicago, St. Paul, Minneapolis & Omaha. It is estimated that inquiries for spikes and bolts for fourth quarter delivery total 18,000 kegs.

Standard Bessemer and open-hearth rails, $43; light rails, rolled from billets, 1.80c. to 1.90c., f.o.b. maker's mill.

Standard railroad spikes, 2.90c. to 3c. mill; track bolts with square nuts, 3.90c. to 4c. mill; steel tie plates, 2.25c. to 2.35c., f.o.b. mill; angle bars, 2.75c.; f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.55c. base, and track bolts 4.55c. base.

Sheets.—Both inquiry and buying showed improvement during the last week in September. Prices have remained steady, although competition is keen and it is reported that Eastern mills are entering the local market more actively. The ordinary differential on black sheets of Gary over Pittsburgh has been $2 a ton, but with 3.10c. the ruling, Pittsburgh base and 3.30c. being quoted at Gary, the spread is $4 per ton.

Chicago delivered prices from mill 3.35c. to 3.40c. for No. 28 black, 2.45c. to 2.50c. for No. 10 blue annealed and 4.40c. to 4.45c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.50c. base for blue annealed, 4c. base for black, and 5c. base for galvanized.

Structural Material.—Inquiry during the week has been unusually heavy for this time of the year. The Whitehead & Kales Iron Works will fabricate 960 tons of steel for the Grand Rapids Trust Building and the Gage Structural Steel Co. has been awarded 760 tons for a theater building in Madison, Wis. Bids will soon be taken on 3500 tons for the Lake Shore Athletic Club, Chicago. Other pending items are the Federal Rubber Co., Cudahy, Wis.; a plant building, 600 tons, and the Standard Oil Co. Building addition, South Michigan Avenue, Chicago, 700 tons. Mill prices for plain material remain steady at 2.10c., Chicago.

The mill quotation on plain material is 2.10c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Bolts, Nuts and Rivets.—Tire bolts have been reduced from 50, 10 and 5 off to 60 and 5 off. Fourth quarter contracting has made good headway and specifications are being received at an unchanged rate. For mill prices see page 927.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.70c.; machine bolts up to ⅞ x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to ⅞ x 4 in., 50 off; larger sizes, 50 off; hot-pressed nuts, squares, tapped or blank, $3.50 off; hot-pressed nuts, hexagons, tapped or blank, $4 off; coach or lag screws, 60 per cent off.

Cast Iron Pipe.—The ruling quotations on pipe are $41 to $42, base Birmingham, for 6-in. and larger sizes. Foundries are well booked and the delivery situation remains unchanged. The United States Cast Iron Pipe & Foundry Co. closed for 170 tons of 6-in., Class B for Waukegan, Ill.; 250 tons of 8-in., Class C, for Evansville, Ind., and 900 tons of 6-in., Class B, for Evanston, Ill. The National Cast Iron Pipe Co. was the successful bidder on 175 tons of 4 and 6-in., Class B, for La Grange, Ill., and 250 tons of 6, 8 and 10-in., Class B, for Allouez, Wis. The American Cast Iron Pipe Co. booked 310 tons of Class B in miscellaneous sizes for South Pekin, Ill. Roachdale, Ind., is making inquiry for 208 tons of 8-in., 40 tons of 6-in. and 105 tons of 4-in., all Class B. Litchfield, Ill., will receive tenders for 700 tons of 6 and 10-in., Class B.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $53.20 to $54.20; 6-in. and over, $49.20 to $50.20; Class A and gas pipe, $4 extra.

Reinforcing Bars.—Activity in both buying and inquiry is well maintained. Although a number of fair-sized projects have been awarded, the bulk of the business is made up of numerous small bookings. The tonnage of reinforcing bars pending is unusually large for this time of the year, indicating that a substantial construction program will be carried well into the winter. Warehouse prices on billet steel reinforcing bars are steady at 2.60c., Chicago. Lettings include:

Eagles Club, Milwaukee, Wis., 250 tons, to American System of Reinforcing.

W. H. Graham, building, Aurora, Ill., 150 tons, to Olney J. Dean & Co.

Brown & Bigelow Co., Minneapolis, Minn., 350 tons, to Olney J. Dean & Co.

Alfred Peats Co., 810 Belmont Avenue, Chicago, warehouse, 100 tons of rail steel, to Calumet Steel Co.

Hotel and stores, 410 Diversey Parkway, Chicago, 225 tons of rail steel, to Calumet Steel Co.

New York Central, under-crossing, Hammond, Ind., 100 tons, to Joseph T. Ryerson & Son.

Rockefeller Chapel, University of Chicago, Chicago, 100 tons, to Joseph T. Ryerson & Son.

Shrine Temple, Des Moines, Iowa, 265 tons, to Concrete Engineering Co.

North Side sewage treating plant, Niles Center, Ill., 400 tons of rail steel, to Inland Steel Co.

Pending business includes:

Mausoleum, Chicago, 100 tons. General contract awarded to G. A. Carlson.

Singer Building, State Street, Chicago, 100 tons. R. F. Wilson & Co., general contractor.

Vocational school, Oshkosh, Wis., 250 tons, general contract awarded to C. R. Meyer & Sons.

Philip W. Peck Building, 510 South Wabash Avenue, Chicago, 450 tons. General contract to F. R. Wilson & Co.

Wiebo'dt Hall, Northwestern University, general contract to R. C. Wieboldt Co. Tonnage not stated.

Illinois Masonic hospital, 834 Wellington Avenue, Chicago, 115 tons. James Shedden & Co., general contractors.

Lloyd's Theater, department store and apartment building, South Bend, Ind., 900 tons. Ralph Sollitt, general contractor.

Coke.—By-product foundry coke has been advanced 50c. a ton, making the price $10.25 at the ovens, and $10.75 delivered in the Chicago switching district. Buying is principally for fourth quarter requirements and will total about the same for September as during August.

Old Material.—This week has shown further weakness in the scrap market and prices, in general, are somewhat lower. Buying is still confined to carlot transactions, with no immediate indications that the situation will change in the near future. Probably less distress tonnage is appearing on track and reports seem to justify the impression that there is slightly less congestion in the purchasers' receiving yards. Rumors that a large purchaser had bought heavily of melting steel at $17 are discredited by the trade. In fact, dealers have been led to believe by this consumer that its inventories are the largest in three years. Railroad lists include: Chicago, Burlington & Quincy, 5600 tons; New York Central, 15,000 tons, 10,000 of which is rerolling rails; Chicago, Milwaukee & St. Paul, 3000 tons, and the Michigan Central, a blind list.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	$18.50 to $19.00
Cast iron car wheels	17.50 to 18.00
Relaying rails, 56 lb. to 60 lb.	25.00 to 26.00
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Forged steel car wheels	19.00 to 19.50
Railroad tires, charging box size	19.25 to 19.75
Railroad leaf springs, cut apart	19.25 to 19.75
Rails for rolling	19.00 to 19.50
Steel rails, less than 3 ft.	19.50 to 20.00
Heavy melting steel	16.00 to 16.25
Frogs, switches and guards, cut apart	17.75 to 18.25
Shoveling steel	16.00 to 16.25
Drop forge flashings	12.00 to 12.50
Hydraulic compressed sheets	13.75 to 14.25
Axle turnings	14.00 to 14.50
Steel angle bars	19.00 to 19.50
Steel knuckles and couplers	19.00 to 19.50
Coil springs	19.75 to 20.25
Low phos. punchings	18.00 to 18.50
Machine shop turnings	9.50 to 10.00
Cast borings	12.75 to 13.25
Short shoveling turnings	12.75 to 13.25
Railroad malleable	18.50 to 19.00
Agricultural malleable	18.00 to 18.50

Per Net Ton

Iron angle and splice bars	18.25 to 18.75
Iron arch bars and transoms	20.75 to 21.25
Iron car axles	26.50 to 27.00
Steel car axles	17.50 to 18.00
No. 1 busheling	12.75 to 13.25
No. 2 busheling	9.00 to 9.50
Pipes and flues	11.25 to 11.75
No. 1 railroad wrought	14.50 to 15.00
No. 2 railroad wrought	14.25 to 14.50
No. 1 machinery cast	17.75 to 18.25
No. 1 railroad cast	17.00 to 17.50
No. 1 agricultural cast	16.75 to 17.25
Locomotive tires, smooth	16.50 to 17.00
Stove plate	14.50 to 15.00
Grate bars	14.50 to 15.00
Brake shoes	14.50 to 15.00

Scrap Prices Weak as Consumers Hold Up Shipments

DETROIT, Sept. 29.—Consumption of waste material produced in this district continues to cover the current production. Very few new orders are being placed, and with several large scrap consumers in Ohio still withholding shipments, the general tone of the market is soft, although no decline in prices has been registered during the week. Lettings for October show tonnages slightly higher than for September.

New York

Pig Iron Fairly Active and Firmer—Sustained Buying of Structural Steel

NEW YORK, Sept. 29.—The pig iron market is in a state of transition. Buying by the larger foundry interests is subsiding concurrently with advances in furnace quotations and, while prices are said to be firm at the higher levels, they have been put to no real test. Some sales of foundry grades, however, have been made at $21, base, eastern Pennsylvania furnace; at $19, base, Buffalo, and at $24, Virginia stack. One Buffalo producer is asking $19.50, furnace, for prompt delivery. Meanwhile the situation is influenced by continued offerings of foreign iron and the prospective blowing in of two furnaces in this State in November. Dutch No. 1X foundry is being offered at $21.50 to $22, duty paid, New York, and Indian foundry iron still figures actively in the market. Although the heavier melters have bought freely recently, it is still believed in some quarters that their purchases did not cover more than 70 to 80 per cent of their fourth quarter needs. In the meantime melt is slowly gaining. The smaller melters have been conspicuous by their absence from the market and are not likely to make forward purchases until there is no longer any doubt that prices are on the upward trend. The most recent sizable purchase was by the Burnham Boiler Co., which closed for 1500 tons of foundry for its Elizabeth, N. J., and Lancaster, Pa., plants. Half of the tonnage went to eastern Pennsylvania and the remainder is understood to have been foreign iron. The recent purchase of the Central Foundry Co. was 2500 tons instead of 5000 tons as previously stated. Richardson & Boynton divided 7500 tons between Buffalo and eastern Pennsylvania producers. Prominent among new inquiries is 3300 tons of foundry and malleable wanted by the Ingersoll-Rand Co. for its Phillipsburg, N. J., and Painted Post, N. Y., plants. The American Locomotive Co., which recently closed for 4250 tons of foundry grades, is now in the market for 500 to 1000 tons of low phosphorus for the Philadelphia district. John A. Roebling's Sons Co., Trenton, N. J., has bought 2000 tons of foreign low phosphorus for 1925 delivery. Considerable Buffalo foundry continues to move by barge via the Erie Canal and the Hudson River to New York, Brooklyn and points beyond as far as Phillipdale, R. I. The barge rate for delivery alongside to points within the lighterage limits of New York and Brooklyn is $2.75 a ton, as compared with an all-rail rate of $4.91. The season of navigation on the canal, however, will close in a month or two.

We quote delivered in the New York district as follows, having added to furnace prices $2.52 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.54 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25	$23.02 to $23.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	23.52 to 24.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	24.02 to 24.52
Buffalo, sil. 1.75 to 2.25 (all rail)	23.41 to 23.91
Buffalo, sil. 1.75 to 2.25 (by barge canal del'd alongside in lighterage limits N. Y. and Brooklyn)	21.25 to 21.75
No. 2 Virginia, sil. 1.75 to 2.25	28.54 to 29.04

Ferroalloys.—There is very little activity in ferromanganese or spiegeleisen, but prices continue firm. A sale is noted of 200 tons of ferromanganese by a domestic producer, in which some reciprocal arrangements are understood to have entered. It is stated that a large consumer is about to issue inquiries for 600 tons. Sales of carload lots of both ferromanganese and spiegeleisen continue.

Finished Iron and Steel.—The fourth quarter is being ushered in without any conspicuous change in the buying methods of manufacturing consumers and jobbers. Some fourth quarter contracts have been entered into, but for the most part buyers are content to fill their requirements for short periods, usually not over 30 days. Deliveries are lengthening slightly, but are still satisfactory in the main. Some sheet mills are quoting four or five weeks on certain gages, and deliveries on steel bars have lengthened to three weeks in some instances, but on shapes and plates fairly prompt rollings are obtainable. Efforts of the mills to stiffen prices have not been successful except in steel bars, which are now more firmly established at 2c., Pittsburgh. Some commitments have been made at 1.90c., which will expire with the end of the month (Wednesday). Plates are weaker, more sales having been made at 1.70c., Pittsburgh, chiefly by Eastern mills, and 1.75c. is now the maximum except on less than carload lots. Further weakness has developed also in black sheets, which have again been sold at 3c., Pittsburgh, with 3.10c. the top of the market. Likewise, some mills have abandoned efforts to get 4.30c. on galvanized sheets and are quoting freely at 4.20c., Pittsburgh. Plate tonnage continues below normal and though improving in volume is still far less than the capacities of the mills. On structural shapes most mills are firm at 1.90c., Pittsburgh, but lower prices are occasionally quoted by one or two of the smaller producers. Bar iron is obtainable at 2.14c. to 2.19c., New York. Structural steel contracts have been large and include 5700 tons for New York subways, with 5500 tons more up for bids. An office building at Fifth Avenue and Forty-fourth Street requires 6000 tons and there are many loft and apartment buildings in the market.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c.; plates, 2.09c. to 2.19c.; structural shapes, 2.14c. to 2.24c.; bar iron, 2.14c. to 2.24c.

Warehouse Business.—The sheet market continues to show a fairly wide range of prices on both black and galvanized, with concessions in some cases ranging down to 25c. and as much as 35c. per 100 lb. below the schedule. Although the market is only moderately active, September is reported as comparing favorably with August and with some jobbers it is expected to prove a better month. Prices are quoted on page 946. We quote boiler tubes per 100 ft. as follows:

Lap welded steel tubes, 2-in., $17.33; seamless steel, 2-in., $20.24; charcoal iron, 2-in., $25; 4-in., $67.

Cast Iron Pipe.—Inquiries for bell and spigot pipe from gas companies are beginning to develop in good volume with prices holding quite firm except when foreign competition is encountered. Bids will be opened Oct. 6 by Pleasantville, N. J., on 1000 tons of 14-in. pipe. Norwich, Conn., closed last week on 6000 tons of 24-in. pipe with the Pont-a-Mousson works. Active inquiry for gas pipe for private users is promised to the end of this year. The soil pipe market continues weak with both Northern and Southern makers endeavoring to bolster the market by quoting 2½ points smaller discounts, but booking most of the current business at the old level.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $50.60 to $51.60; 4-in. and 5-in., $55.60 and $56.60; 3-in., $65.60 to $66.60, with $5 additional for Class A and gas pipe. Discounts of both Northern and Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 45 to 50 per cent off list; heavy, 55 to 60 per cent off list.

Old Material.—No. 1 heavy melting steel is quiet and not overly strong, with brokers' buying prices still holding at $16 to $17 per ton, depending on the freight rate to point of delivery.

Buying prices per gross ton New York follow:

Heavy melting steel, yard	$12.00 to $12.50
Heavy melting steel (railroad or equivalent)	13.25 to 13.50
Rails for rolling	14.25 to 14.75
Relaying rails, nominal	23.00 to 24.00
Steel car axles	21.50 to 22.00
Iron car axles	24.00 to 24.50
No. 1 railroad wrought	14.50 to 15.00
Forge fire	10.50 to 11.00
No. 1 yard wrought, long	13.50 to 14.00
Cast borings (steel mill)	9.50 to 10.00
Cast borings (chemical)	13.00 to 14.00
Machine shop turnings	10.00 to 10.50
Mixed borings and turnings	9.75 to 10.25
Iron and steel pipe (1 in. diam., not under 2 ft. long)	12.75 to 13.25
Stove plate	11.00 to 12.00
Locomotive grate bars	11.00 to 11.50
Malleable cast (railroad)	15.00 to 15.50
Cast iron car wheels	14.00 to 14.50
No. 1 heavy breakable cast	13.25 to 14.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$18.00 to $18.50
No. 1 heavy cast (columns, building material, etc.), cupola size	16.50 to 17.00
No. 2 cast (radiators, cast boilers, etc.)	15.50 to 16.00

SIDE GUIDE AND GRIPPER

San Francisco

Electrically Welded Pipe Selected for Mokelumne River Work—75,000 Tons of Plate Placed

SAN FRANCISCO, Sept. 26 (*By Air Mail*).—Upon recommendations of the board of engineers, the directors of the East Bay Municipal Utility District, Oakland, Cal., last night awarded contracts for the construction of the major portion of the Mokelumne River project. Twohy Brothers, San Francisco, have been awarded the largest item which calls for construction of an electrically welded steel pipe line from the Lafayette Tunnel to the western border of the vicinity known as the Peat Lands. This will require approximately 75,000 tons of plates, which will be fabricated by the Steel Tank & Pipe Co., Berkeley, Cal., and the Newport News Shipbuilding Co. The pipe line bid totaled $10,444,986. The entire plate tonnage was placed with the Carnegie Steel Co.

The engineers' report recommending electrically welded pipe states that the Twohy Brothers company "is willing to make satisfactory guarantees that protect the district against loss in case this new type of construction should prove unacceptable. This company engages, in that event, to construct the pipe of riveted steel, upon which, also, it is initially the lowest bidder, and which it further agrees to furnish for only 40 per cent of the excess of its bid price on riveted steel over that for electrically welded steel, in case the latter proves unacceptable."

The bids on the Lancha Plana dam, reservoir and power house have been held in abeyance pending the settlement of legal technicalities involving water rights. Hearings will be resumed by State and Federal commissions, Sept. 29, at Sacramento. An action in equity, also, has been filed in the United States District Court in San Francisco, seeking to restrain the utility district from signing contracts until water rights have been legally established on property adjacent to public lands. The State Supreme Court has denied the petition for a rehearing by the litigants who attacked the validity of the bond issue.

Pig Iron.—A local importer has received about 200 to 300 tons of special grade Belgian iron for a local user. A fresh inquiry for about 300 tons of malleable iron has appeared, and the recent inquiry for 1000 tons of malleable is understood to be still pending. Buying generally is confined to small lots. Prices are unchanged.

*Utah basic	$27.00 to $28.00
*Utah foundry, sil. 1.75 to 2.25	27.00 to 28.00
**English foundry	26.00
**Belgian foundry	24.50 to 25.00
**Dutch foundry	24.00
**Indian foundry	24.00
**German foundry	25.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—No fresh inquiries have come into the market, although plans are being prepared for a number of new projects on which bids are expected to be called within a few weeks. Lettings known to have been closed during the week total 550 tons. The largest, 400 tons, for a hospital in Los Angeles, has been taken by the Baker Iron Works. New bids will be called Oct. 5, for a city auditorium in Sacramento requiring 540 tons. The Palm Bridge & Iron Works is low bidder on 250 tons for the State Exposition Building, Reno, Nev. While most Eastern mills continue to quote 2.35c., c.i.f. Coast ports, 2.30c. is now more or less generally recognized as the market minimum on desirable tonnages.

Plates.—Rumors that a low price was quoted by an Eastern independent mill on the 75,000 tons of plates to be used for the Mokelumne River pipe line, followed by information that all of the tonnage was placed in the East with the leading producer, and indications that 2.25c., c.i.f. Coast ports is now being named on moderate tonnages by several Eastern mills, have been the three most arresting features of the week. While some business has been closed at 2.25c., the majority of the larger Eastern mills continue to quote 2.30c. The General Petroleum Co. has placed 1500 tons of plates and small shapes with two Eastern mills. The 325 tons required for the South San Joaquin Irrigation District, Manteca, Cal., has been taken by the Moore Dry Dock Co. The Southern Pacific Equipment Co. will close bids Oct. 2 for 125 tons.

Bars.—Reinforcing bars are understood to have been laid down in Seattle, Wash., by an independent mill at 2.25c., c.i.f. Merchant bars are quoted at 2.35c., c.i.f. Coast ports, by Eastern mills, and at 2.40c., f.o.b. San Francisco, by local mills, but it is understood that lower prices have been named recently on desirable tonnages. Jobbers' quotations on reinforcing bars continue to give evidence of price weakness. Less than 2.90c., carload on an out-of-stock basis, is generally considered possible, and 3.55c., l.c.l., cut to length, and less, is being named, although, as stated last week, some jobbers continue to ask and get 3.80c. on small orders that require cutting.

Rails and Track Supplies.—The Southern Pacific Co. is taking bids on 1200 tons of round track spikes. The Key System Transit Co., Oakland, Cal., has put out an inquiry for 100 tons of 70-lb. rails, and 250 kegs of track spikes. The Los Angeles Railroad Co. will close bids Sept. 30, for 1200 tons of 116-lb. girder rails and 250 tons of track spikes. The State Board of Harbor Commissioners, San Francisco, has placed 108 tons of 85-lb. rails with foreign interests at a price understood to be $45, c.i.f., duty paid, which is reported to be about $7 less than the lowest American bid. It has also placed 141 tons of 7-in. girder rails and 60 tons of 127-lb. guard rails with two Eastern mills. Plans are being made by the engineering department of the Los Angeles County Flood Control District, 202 North Broadway, Los Angeles, for the construction of ten miles of railroad from Azusa to the site of the proposed San Gabriel River dam.

Warehouse Business.—Business during the past week, although small in volume, has shown indications of improvement.

Merchant bars, $3.30 base, per 100 lb.; merchant bars, ⅝ in. and under, rounds, squares and flats, $3.80 base, per 100 lb.; soft steel bands, $4.15 base, per 100 lb.; angles, ⅛ in. and larger x 1½ in. to 2¾ in., inc., $3.30 base, per 100 lb.; channels and tees, ¾ in. to 2¾ in., inc., $3.90 base, per 100 lb.; angles, beams and channels, 3 in. and larger, $3.30 base, per 100 lb.; tees, 3 in. and larger, $3.30 base, per 100 lb.; universal mill plates, ¼ in. and heavier, stock lengths, $3.30 base, per 100 lb.; spring steel, ¼ in. and thicker, $6.30 base per 100 lb.; wire nails, $3.50 base, per 100 lb.; cement coated nails, $3 base, per 100 lb.; No. 10 blue annealed sheets, $3.70 per 100 lb.; No. 28 galvanized sheets, $5.75 per 100 lb.; No. 28 black sheets, $4.65 per 100 lb.

Cast Iron Pipe.—Fresh inquiries have been small, and recent lettings have not been numerous. Quotations are fairly firm at $50 base, water shipment, San Francisco. Among the larger lettings placed recently are the following:

Needles, Cal., 6 and 10-in. B, 744 tons, contractor's letting through Claude Fisher.
Mesa, Ariz., 4, 6, 8, 10 and 12-in. B, 285 tons, contractor's letting through Fisher & McCall.
Santa Monica, Cal., 4, 6 and 8-in. B, 354 tons, contractor's letting through Fisher & McCall.
Gilbert, Ariz., 4, 6 and 8-in. B, 210 tons, contractor's letting through Fisher & McCall.

Steel Pipe.—Los Angeles has opened bids on 274 tons of 2-in. standard black pipe, and 6-in. Matheson joint pipe.

Coke.—Buying is confined to small lots, although the aggregate number of small orders is fairly substantial. Prices are steady.

English beehive, $15 to $16 at incoming dock, and English by-product, $12 to $14; German by-product, $11.50 to $12.

Old Material.—Because of the fairly large supply of material that the local mills have accumulated, buying has not developed to the extent that some believed that it would. Prices have not been tested.

Prices for scrap per gross ton delivered to consumers' yards are as follows:

No. 1 heavy melting steel	$11.50 to $12.00
Scrap rails, miscellaneous	11.50 to 12.00
Rolled steel wheels	11.50 to 12.00
Couplers and knuckles	11.50 to 12.00
Mixed borings and turnings	6.00 to 6.50
Country mixed scrap	8.00 to 8.50
No. 1 cast scrap	19.50 to 20.00

SIDE GUIDE AND GRIPPER

Cincinnati

Wire and Nails Weak—Scrap Holds Despite Dull Market—Heavier Pig Iron Sales

CINCINNATI, Sept. 29.—Freer buying of pig iron has resulted in sales totaling 10,000 tons during the past week. The increased activity is accounted for by the desire of consumers to cover their fourth quarter requirements and by the rising volume of trade in first quarter iron. Northern foundry iron in the Ironton district remains at $19.50 to $20, base furnace. One producer is asking $20.50, but has been unable to obtain orders at this quotation. Sellers are holding to $20 for first quarter delivery. Although one Alabama furnace is accepting business at $19, base Birmingham, for the last quarter, two companies refuse to take less than $19.50, and a fourth producer is out of the market with a quotation of $20.50. Alabama interests, anticipating the continued upward movement of prices, are declining to quote on first quarter inquiries. Tennessee iron has been dormant, but it is firmly established at $18.50, base Birmingham. Jackson County silvery furnaces are adhering rigidly to their schedule announced a week ago, but are asking $1 a ton more for the first quarter. Malleable iron varies from $19.50 to $20, furnace, although it is reported, but not confirmed, that competition with Lake interests brought out a lower price on a lot of 1500 tons for Indiana delivery. Sales of Northern foundry iron include 1500 tons to a Michigan melter and 400 tons to a central Ohio consumer, while malleable orders embrace 750 tons for a Springfield, Ohio, melter and 500 tons for a Dayton, Ohio, company. Activity in Alabama iron involved lots ranging from single carloads up to 400 tons. The Belfont Steel & Wire Co., Ironton, Ohio, is preparing to blow in its Sarah furnace before the end of the year.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)	$23.05 to $23.55
Alabama fdy., sil. 2.25 to 2.75	23.05 to 23.55
Tennessee fdy., sil. 1.75 to 2.25	22.55
Southern Ohio silvery, 8 per cent	28.27
Southern Ohio fdy., sil. 1.75 to 2.25	21.77 to 22.27
Southern Ohio, malleable	21.77 to 22.27

Wire Goods.—Although consumer buying has not been brisk, bookings of fair volume have been recorded. Sellers are concerned over the price situation, which is already unsatisfactory to Eastern mills and which threatens to become more aggravated. Independent producers in Ironton are shipping nails and wire by barge to Ohio River points and their competitors are compelled to meet low prices to obtain business. Eastern sellers, therefore, are taking orders for common wire nails at $2.74 per keg, delivered in Cincinnati, which is equivalent to $2.45, Pittsburgh. They have lowered their quotations on plain wire to $2.59 per 100 lb., delivered here, which figures back to $2.30, Pittsburgh. Despite the fact that Ironton mills have the benefit of a 14c. barge rate to this city, a decrease in the rate is expected when they start operating their own barge line. It is understood that nails will be sold on the basis of a mill price plus the actual cost of transportation, which may be only 5c. to 7c. When this arrangement goes into effect in the near future it is anticipated that nails can be secured in Cincinnati at $2.65 per keg, delivered.

Bars, Plates and Shapes.—The buying movement, which attained its crest several weeks ago, has subsided. Eastern interests have been trying energetically to establish ban on a 2c., Pittsburgh, basis, but independent mills continue to tempt consumers by offering 1.00c., Pittsburgh, in sizable orders. Although plates are quoted at 1.85c. to 1.90c., Pittsburgh, sellers will deviate from these figures to absorb an important tonnage at 1.80c., Pittsburgh. Order for small lots of shapes are being taken at 2c., Pittsburgh, but here again quotations dip to 1.90c., Pittsburgh, when a substantial inquiry comes out. Eastern mills state that they are now accepting fourth quarter business at 2c., Pittsburgh, on bars and shapes, and at 1.90c. on plates.

Sheets.—One seller reports that in volume of orders the past week exceeded any previous week in the past six months. Buying continues to be restricted to tonnages for delivery within 60 days, but the meager stocks possessed by consumers warrant liberal purchases to fill immediate needs. The roofing business has been below normal this year and therefore galvanized sheet sales have suffered. Even though orders for roofing purposes have been less than expected, dealers believe a buying movement will develop late in the fall. Galvanized sheets are quoted at 4.20c., Pittsburgh. Black sheets still display weakness and concessions made by mills enable buyers to secure prices ranging from 3c. to 3.15c., Pittsburgh. Improvement is noticeable in blue annealed sheets, which have firmed up to 2.25c. to 2.30c., Pittsburgh. It is possible to secure the former quotation only on attractive tonnages.

Tin Plate.—Unusual activity among several can manufacturers has resulted in the sale of important tonnages of tin plate for prompt delivery. Consumers are now specifying for their November requirements. Prices are steady at $5.50 per base box, Pittsburgh.

Reinforcing Bars.—The Bourne-Fuller Co. has been awarded 125 tons for the Sunrise Avenue bridge, Dayton, Ohio, while bids have closed on a new warehouse for the Kroger Grocery & Baking Co., Columbus, Ohio, which will take 485 tons. Decision is expected the coming week on 350 tons for the American Insurance Union Building at Columbus. The price of new billet bars remains at 2c., Cleveland, with 1.90c., mill, as the prevailing quotation on rail steel bars.

Warehouse Business.—The market has been rather spotty. Some jobbers have done a liberal volume of business, but others have been less fortunate. Prices are unchanged.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4c. to 4.25c.; bands, 3.90c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds and hexagons, 3.85c.; squares, 4.35c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.10c.; No. 28 galvanized sheets, 5.25c.; No. 9 annealed wire, $3 per 100 lb.; common wire nails, $2.95 per keg base; cement coated nails, $2.40 per keg; chain, $7.55 per 100 lb. base; large round head rivets, $3.75 base; small rivets, 65 per cent off list. Boiler tubes; prices net per 100 ft. lap welded steel tubes, 2-in., $18; 4-in., $38; seamless, 2-in., $19; 4-in., $39.

Coke.—Coke sellers have announced that the price of by-product foundry coke, which is $9.64, delivered in Cincinnati, will be unchanged during October. While by-product foundry coke shipments during September improved 10 per cent as compared with August, furnace grades suffered from the curtailment of blast furnace activities in the Ironton district. Dealers are well stocked with domestic coke, which is fairly active.

Old Material.—The mill situation has not altered in the past week. Until Portsmouth, Ohio, consumers again accept shipments and other plants begin to buy, the market will continue dull. Dealers express confidence in a resumption of buying on a wide scale within the next month, despite the present indifference shown by the mills. In this expectation prices retain their strength, with heavy melting firm at $15 to $15.50.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	$15.00 to $15.50
Scrap rails for melting	14.50 to 15.00
Short rails	18.50 to 19.00
Relaying rails	28.00 to 28.50
Rails for rolling	15.50 to 16.00
Old car wheels	14.00 to 14.50
No. 1 locomotive tires	17.00 to 17.50
Railroad malleable	16.00 to 16.50
Agricultural malleable	15.50 to 16.00
Loose sheet clippings	10.50 to 11.00
Champion bundled sheets	12.00 to 12.50
Per Net Ton	
Cast iron borings	9.00 to 9.50
Machine shop turnings	8.00 to 8.50
No. 1 machinery cast	19.00 to 19.50
No. 1 railroad cast	15.50 to 16.00
Iron axles	23.00 to 23.50
No. 1 railroad wrought	12.00 to 12.50
Pipes and flues	9.00 to 10.00
No. 1 busheling	11.00 to 11.50
Mixed busheling	9.50 to 10.00
Burnt cast	10.00 to 10.50
Stove plate	11.00 to 11.50
Brake shoes	11.00 to 11.50

Buffalo

Pig Iron Stronger with Inquiries Totaling 20,000 Tons—Scrap Holds Its Own

BUFFALO, Sept. 29.—A much better note is sounded in the market this week. Inquiry is much healthier and sales have been made freely. One local furnace which has booked 15,000 to 20,000 tons of iron is quoting $19.50 base for delivery between now and Nov. 1, and $19 for delivery in November and December. The quotation of $19.50 is really an indication that this furnace is out of the market for delivery before Nov. 1. Another selling agency has booked 10,000 tons, including two or three orders of 1000 tons each. The American Locomotive Co., which has been in the market for 4500 tons of foundry, is thought to have placed it. A fresh inquiry is out for 5000 tons of foundry of different grades for delivery over the last and first quarters. A New Jersey inquiry calls for close to 4000 tons of foundry and a New York State melter wants 1000 tons of foundry. A State melter requiring 1800 tons of foundry has placed orders. Many other inquiries call for 500 tons, or more, combining for a total of possibly 20,000 tons. The market is rather firm at $19, base, the price of $18.50 having almost disappeared. A recent day's production for a Wickwire furnace was 652 tons.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil. 1.75 to 2.25	$18.50 to $19.00
No. 2X foundry, sil. 2.25 to 2.75	18.50 to 19.00
No. 1 foundry, sil. 2.75 to 3.25	19.00 to 19.50
Malleable, sil. up to 2.25	18.50
Basic	18.50
Lake Superior charcoal	29.28

Finished Iron and Steel.—Bar inquiry is light. The price of 2.265c., base Buffalo, has been broken, with some local mills doing as low as 2.165c. Shapes are selling at a similar price. Sheet inquiry is not active. Black and galvanized are nominally 3.465c. and 4.565c., Buffalo, respectively, though some shading has been done. Nuts and bolts are rather active, with prices fairly firm. Some forward buying is under way, with many consumers covering for fourth quarter who did not cover for third quarter. The pipe market is moving at the same pace as earlier in the fall, with butt weld principally in demand. Wire business is much improved, particularly screen cloth demand.

Warehouse prices are being quoted as follows: Steel bars, 3.25c.; steel shapes, 3.35c.; steel plates, 3.35c.; No. 10 blue annealed sheets, 3.80c.; No. 28 black sheets, 4.75c.; No. 28 galvanized, 5.45c.; cold rolled shapes, 4.40c.; cold rolled rounds, 3.95c.; wire nails, 4c.; black wire, 4.05c.

Old Material.—The situation has not materially changed from that reported last week, except that there is better feeling. Although there has been no buying of importance, dealers are confident that early October will see sizable orders. The last railroad lists were small and little of the material came to Buffalo. What heavy melting steel did come to Buffalo brought close to $19. Some inquiries from Pittsburgh and Youngstown have been received. There is considerable demand for low phosphorus from steel castings plants, which are beginning to feel the impetus of better business. Several small tonnages of short rails have been sold at $20.50 to $21. The Buffalo consumer of stove plate who has been an active buyer is now out of the market, and stove plate has receded to $15. Cast scrap lies dormant, with little demand on the part of the gray iron foundries.

We quote prices f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel	$18.00 to $18.50
Low phosphorus	20.00 to 20.50
No. 1 railroad wrought	16.50 to 17.00
Car wheels	16.50 to 17.50
Machine shop turnings	12.00 to 12.50
Cast iron borings	12.00 to 12.50
No. 1 busheling	16.50 to 17.00
Stove plate	15.00
Grate bars	14.50 to 15.00
Hand bundled sheets	13.00 to 13.50
Hydraulic compressed	16.50 to 17.50
No. 1 machinery cast	16.50 to 17.00
Railroad malleable	19.50 to 20.00
No. 1 cast scrap	17.00 to 17.50
Iron axles	26.00 to 27.00
Steel axles	20.00 to 20.50

St. Louis

Coke and Pig Iron Advance While Scrap Declines—6000-Ton Rail Inquiry

ST. LOUIS, Sept. 29.—While buying of pig iron is light, makers are being pressed by melters in the district to hasten shipments against contracts, which would indicate that stocks are small and that the fourth quarter will witness an increase in orders. There are no sizeable inquiries now before the market. The local furnace is well sold and producers generally are making no active efforts to stir up business. The market is firm at $21.50, Chicago; $18.50 to $19.50 base, Birmingham, and $22.50 to $23, Granite City. The latter furnace sold 1900 tons of low grade pig iron in small lots to melters in the district.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices, $2.16 freight from Chicago, $5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$23.56
Northern malleable, sil. 1.75 to 2.25	23.56
Basic	23.56
Alabama fdy., sil. 1.75 to 2.25 (rail)	$22.67 to 24.67
Tennessee fdy., sil. 1.75 to 2.25	22.67
Granite City iron, sil. 1.75 to 2.25	23.31 to 23.81

Coke.—The passing of the hot wave brought an increase in demand for domestic coke, and the market is becoming firmer. There has been a marked expansion in demand for foundry coke, and the St. Louis Coke & Iron Co. has advanced its price 50c. a net ton to $9.50, Granite City. The local by-product oven is quoting $10, St. Louis.

Old Material.—With the exception of a few foundry grades, which are higher, most items in the old material list have declined, the decrease being from 25c. to $1 a ton. The market is weaker despite the fact that pig iron is advancing, which recalls the fact that when pig iron was declining old material rose. This is an incongruity which seasoned observers find it difficult to explain. Mills in this district are buying only to fill pressing needs. Lists include: Dodge Brothers, Detroit, 4500 tons; Missouri Pacific, 700 tons; Chicago, Burlington & Quincy, 5500 tons; Big Four, 2700 tons; Union Pacific, 2000 tons, and Chicago, Milwaukee & St. Paul, 750 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	$15.00 to $15.50
Rails for rolling	19.50 to 20.00
Steel rails less than 3 ft.	18.50 to 19.00
Relaying rails, 60 lb. and under	23.50 to 24.00
Relaying rails, 70 lb. and over	30.00 to 31.00
Cast iron car wheels	17.50 to 18.00
Heavy melting steel	15.50 to 16.00
Heavy shoveling steel	15.25 to 15.75
Frogs, switches and guards cut apart	17.50 to 18.00
Railroad springs	18.00 to 18.50
Heavy axles and tire turnings	13.00 to 13.50
No. 1 locomotive tires	16.50 to 17.00
Per Net Ton	
Steel angle bars	16.00 to 16.50
Steel car axles	17.50 to 18.00
Iron car axles	25.50 to 26.00
Wrought iron bars and transoms	19.50 to 20.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	13.00 to 13.50
Cast iron borings	11.00 to 11.50
No. 1 busheling	12.50 to 13.00
No. 1 railroad cast	17.00 to 17.50
No. 1 machinery cast	17.50 to 18.00
Railroad malleable	14.25 to 14.75
Machine shop turnings	8.00 to 8.50
Bundled sheets	9.00 to 9.50

Finished Iron and Steel.—The rail purchase of the Kansas City Southern Railway is expected to total 6000 tons of 100-lb., instead of 3000, as reported last week. Contracts for reinforcing bars have been obtained by the Laclede Steel Co. as follows: 400 tons for Poland Street Docks, New Orleans; 200 tons for a hotel in East St. Louis, and 100 tons for a factory for the St. Louis Label Co. Warehouses in the Eighth Federal Reserve District report continued satisfactory business, with two of the leading interests showing

August sales the largest ever made in that month. Buying from the mills continues on a hand-to-mouth basis.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.25c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, cold rolled, one pass, 4.50c.; galvanized sheets, No. 28, 5.50c.; black corrugated sheets, 4.65c.; galvanized, 5.65c.; cold-rolled rounds, shafting and screw stock, 3.70c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, ⅞ in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 per cent; lag screws, 60 per cent; hot pressed nuts, squares, $3.50; hexagons, blank or tapped, $4 off list.

Boston

Foundries Well Covered on Fourth Quarter Pig Iron Requirements

BOSTON, Sept. 29.—Continued buying of pig iron during the week has filled New England foundry requirements for fourth quarter. There were sales for first quarter as well, including two 1000-ton lots, divided between No. 2X and No. 1X New York State iron. Buying for 1926, however, has been confined largely to the heaviest consumers. Small melters have not, as a rule, covered beyond probable wants for the rest of this year, owing to the uncertainty of their business. One Buffalo furnace has advanced prices on October shipments $1 a ton to $19.50, base furnace, and on November, December and first quarter shipments 50c. a ton to $19, base furnace. There has been an effort on the part of other furnaces in the district to obtain better prices; yet because of foreign iron offerings, actual improvement is slow. Buyers claim $18.50, base furnace, can still be done on Buffalo iron. Alabama iron has sold well for mixture purposes at $19 to $19.50, base Birmingham, and Continental irons also have moved more freely on a basis of $21 to $21.50, on dock Boston, duty paid, although sellers of Dutch iron claim they are on a $22, Boston dock, basis. The lowest at which eastern Pennsylvania iron is available is $21, base furnace, as against $20.50 heretofore, but, like Virgina iron, it is out of line with Buffalo and New York State material, and is consequently inactive. Last week the Washburn Wire Co., Phillipsdale, R. I., received three barges of 500 tons each of Buffalo basic. The canal barge rate from Buffalo to Phillipsdale is $4 a ton, a saving of 91c. under the rail rate.

We quote delivered prices on the basis of the latest sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia, and $9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25	$24.65
East. Penn., sil. 2.25 to 2.75	25.15
Buffalo, sil. 1.75 to 2.25	$23.41 to 24.41
Buffalo, sil. 2.25 to 2.75	23.41 to 24.91
Virginia, sil. 1.75 to 2.25	28.92 to 29.42
Virginia, sil. 2.25 to 2.75	29.42 to 29.92
Alabama, sil. 1.75 to 2.25	28.60 to 29.10
Alabama, sil. 2.25 to 2.75	29.10 to 29.60

Coke.—No change is noted in the by-product foundry coke market. Specifications against contracts are fairly active, yet behind those of last month; ovens are making prompt shipments; and both the New England Coal & Coke Co. and the Providence Gas Co quote $12, delivered, where the freight rate does not exceed $3.10 a ton. Consumption of coke by the average Connecticut foundry is larger than in other New England States, with Massachusetts second. New England coke makers are two to four weeks behind on domestic fuel deliveries. Nut coke is not available inside of four weeks. Consumption of domestic coke is exceptionally heavy because of delivery restrictions on anthracite.

Old Material.—New England foundries are evincing more interest in machinery cast and sales the last week include round tonnages of No. 1 material at $19.50, $19.75 to $20 delivered, while textile machinery, which is in limited supply, is firm at $20.50 to $21 delivered—prices on those materials being 25c. to 50c. a ton higher. Of materials purchased recently for Pennsylvania mill consumption, pipe is the most active. Buyers and sellers cannot agree as to prices on heavy melting steel; consequently little is moving. Demand for turnings and borings has dropped to small proportions, but prices hold well. New England consumers are still in the market for stove plate and shafting at prices quoted a week ago. Some call is noted for scrap rails, but rails for rerolling are inactive and in the opinion of most dealers are worth no more than scrap rails

The following prices are for gross ton lots delivered consuming points:

Textile cast	$20.50 to $21.00
No. 1 machinery cast	19.50 to 20.00
No. 2 machinery cast	15.50 to 16.50
Stove plates	13.50 to 14.00
Railroad malleable	19.00 to 20.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$11.50 to $12.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 yard wrought	12.00 to 12.50
Wrought pipe (1 in. in diam., over 2 ft. long)	12.00 to 12.60
Machine shop turnings	9.00 to 9.50
Cast iron borings, chemical	11.50 to 12.00
Cast iron borings, rolling mill	9.00 to 9.50
Blast furnace borings and turnings	8.50 to 9.00
Forged scrap	9.50 to 10.50
Bundled skeleton, long	10.00 to 10.50
Forged flashings	10.00 to 10.50
Bundled cotton ties, long	9.00 to 9.25
Bundled cotton ties, short	10.00 to 10.50
Shaftings	18.00 to 18.50
Street car axles	18.00 to 18.50
Rails for rerolling	12.50 to 13.50
Scrap rails	11.50 to 12.50

Birmingham

Pig Iron Production Declines—Pipe Foundries Busy

BIRMINGHAM, Sept. 29.—While sales of iron in the South have not been so active recently, quotations are slightly firmer and sentiment is more optimistic. Furnaces are asking $19.50 per ton for No. 2 foundry and with the exception of small spot sales at $19, the higher price rules. The make in the Birmingham district has declined, the Republic Iron & Steel Co. and the Tennessee Coal, Iron & Railroad Co. each having put out a furnace for repairs and relining. The Tennessee company has turned over one furnace from basic to foundry iron to fill a contract for the latter. Eleven blast furnaces in this State are on foundry iron and a similar number on basic, the total number of active stacks being the lowest in many months. Surplus iron will care for demand, although shipments are reducing accumulated stocks more than 15,000 tons a month. The basic iron makers, with the one exception, need their product for own melt. September production in Alabama will show a decline in comparison with August and the October make promises to be further reduced.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil.	$19.00 to $19.50
No. 1 foundry, 2.25 to 2.75 sil.	19.50 to 20.00
Basic	19.00
Charcoal, warm blast	30.00 to 32.00

Rolled Steel.—New business in sight promises steady operation at many of the Birmingham district mills through the remainder of the year and into the coming year. Alabama steel fabricating plants have received a number of contracts in Florida and other Southern sections. Reconstruction of Southern freight tariffs was the subject of discussion among a number of steel manufacturers the past week. Soft steel bars hold at 2.05c. to 2.15c., Birmingham.

Cast Iron Pipe.—Steady production and active shipment of cast iron pressure pipe indicate a strong market. The far West is receiving tonnages of Birmingham-made cast iron pipe, while the Middle West is pressing for shipments in an effort to get delivery before weather conditions interfere with laying. Quotations at $41 to $42, Birmingham, for 6-in. and over, appear firm.

Coke.—Coke output in Alabama has again declined. Low water in creeks has forced beehive ovens to shut down, while by-product coke ovens at Ensley are suspending operations as demand eases up. The Woodward Iron Co. has completed the rebuilding of 40 of its by-product ovens and is adding to output. Quotations are still firm at $4.75 to $5, Birmingham, on foundry coke.

Old Material.—Much old material is moving out of and into dealers' yards, consumption being better. Quotations are firm, but unchanged. Heavy melting steel is in good demand, but remains at $13 to $14. No long-time delivery contracts are being sought by dealers, but it is said that all the scrap that is offered on the market is finding consumers.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical	$15.00 to $16.00
Heavy melting steel	13.00 to 14.00
Railroad wrought	12.00 to 13.00
Steel axles	18.00 to 20.00
Iron axles	17.00 to 19.00
Steel rails	13.00 to 14.00
No. 1 cast	16.00 to 17.00
Tramcar wheels	16.00 to 17.00
Car wheels	15.00 to 16.00
Stove plate	13.00 to 14.00
Machine shop turnings	7.00 to 8.00
Cast iron borings	7.00 to 8.00
Rails for rolling	16.50 to 17.00

Cleveland

Bars Now Firm at 2c.—Pig Iron Sales Aggregate 35,000 Tons

CLEVELAND, Sept. 29.—Mills continue to book a fair volume of orders for finished steel, and some of the larger producers report a gain of from 10 to 15 per cent in bookings in September over August. Steel bar consumers who have been accustomed for some time to secure quick shipments now find that some of the mills are three to four weeks behind on deliveries of some sizes, although others are still able to give rather prompt service. While there has been some fourth quarter buying, mostly in steel bars, only a very small percentage of the consumers so far have contracted for that delivery. Steel bars appear to be well established at 2c., Pittsburgh, in this territory, and fourth quarter sales have been made at that price. However, some close buyers are still holding back orders in the hope of being able to place tonnage at 1.90c. Plates are firm at 1.90c., Pittsburgh, with mills not trying to get more except for small lots. On structural material 1.90c. is the ruling price for lots of any size. Steel is still being taken in good volume by automobile manufacturers and parts makers, although they are not specifying so far ahead as during the summer. The Ford Motor Co. is reported to be getting back to full production, and steel held up by this company because of interruption of plant operations is being released. Little new inquiry is coming out in the structural field. Some of the fabricators need work, and keen competition is resulting in low prices.

Pig Iron.—Foundries are beginning to take more interest in iron for the first quarter and one Lake furnace has sold for that delivery three lots of foundry and malleable iron, aggregating 3000 tons, at 50c. above the present price. One Valley district producer is offering to take first quarter contracts at $20, furnace, or $1 above the current market, while a broker is offering Valley iron at $19.50 for that period. A furnace in the Michigan district which has been on a $21 base for several weeks will take business at the same price for the first quarter. Sales increased somewhat the past week and bookings by Cleveland sellers aggregated about 35,000 tons. No general interest in first quarter contracts has developed among consumers, orders and inquiries for that delivery having come from foundries having castings contracts against which they were anxious to cover. A Cleveland producer has advanced foundry and malleable iron 50c. a ton both for local delivery and outside shipment, now quoting $20 at furnace for Cleveland delivery, at which some sales have been made. The lower price, however, has not yet disappeared. One Lake furnace is still quoting a range of $20 to $20.50. Among orders booked during the week was one for 3000 tons for shipment to western Pennsylvania and 900 tons to a Canton consumer. A northwestern Ohio melter divided 1000 tons between two Lake furnaces. A local producer sold 500 tons of basic iron at $19, but this was special analysis iron and the price was based on an $18.50 price for standard basic. Silvery iron is being quoted at the recent advance, but the higher prices have not been tested by sales. Southern iron is firm at a maximum of $18.50, base Birmingham, for Tennessee iron, with Alabama furnaces asking up to $19.50.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 from Birmingham:

Basic, Valley furnace	$18.50
N'th'n No. 2 fdy., sil. 1.75 to 2.25	$20.00 to 20.50
Southern fdy., sil. 1.75 to 2.25	24.51 to 25.51
Malleable	20.00
Ohio silvery, 8 per cent	30.52
Standard low phos., Valley furnace	27.50 to 28.00

Iron Ore.—There is still some activity in the ore market. A southern Ohio consumer who is planning to blow in a furnace is inquiring for 80,000 tons of ore and another consumer in the same district has placed 40,000 to 50,000 tons with a producer with which it has a long-time contract, for a furnace that will be blown in shortly. One ore firm booked an order for 25,000 tons of manganiferous ore during the week. Some shippers are far ahead on their schedules and ore shipments are falling off. The September movement is expected to be about 1,000,000 tons below August. Late estimates place the season's movement at 52,000,000 to 53,000,000 tons.

Semi-Finished Steel.—An inquiry from a Cleveland consumer for several thousand tons of sheet bars for the fourth quarter has brought out a quotation of $33.50, Youngstown, but it is not definitely established as to whether Youngstown mills would quote that price for shipment to points where they do not have a freight disadvantage. Large billets and slabs are $33.50, Youngstown, and small billets $35. A local mill continues to quote sheet bars, billets and slabs at $35, but several buyers who are in the market for the fourth quarter are endeavoring to secure lower sheet bar prices. This producer is still making heavy shipments on old orders at $35.

Bolts, Nuts and Rivets.—Most of the bolt and nut consumers have covered with fourth quarter contracts at regular prices. Specifications are fair, although demand for large bolts is light. A local rivet manufacturer has advised the trade that instead of booking fourth quarter contracts it will take orders until further notice at $2.50, Cleveland, for large rivets. Small rivets are weak, most buyers being able to get an extra 5 per cent discount. For mill prices see page 926.

Sheets.—Orders are still coming out in good volume, and many of the sheet mills have accumulated a fair backlog. Although several leading producers are taking a firm attitude on prices and are holding at 3.15c., Pittsburgh, on black sheets, this grade is still somewhat irregular, with an occasional quotation as low as 3c. On galvanized sheets 4.20c. is still the more common price, and this is being quoted as a Valley base. Blue annealed sheets are well maintained at 2.25c. Automobile body sheets are firm at the regular quotation.

Strip Steel.—Weak spots have developed in the cold-rolled strip steel market. Although the ruling price is still 3.75c., Cleveland mills, some round lots are reported to have been placed at a concession of $1 a ton. Hot rolled strip is firm at regular quotations. Demand is good and some of the mills are comfortably filled with orders.

Screw Stock.—Prices are still irregular, and there is a probability that the regular quotation will be reduced $2 a ton to 2.45c., Cleveland, which has become rather common.

Reinforcing Bars.—The Conners Creek Sewer, Detroit, for which the general contract has been awarded to George R. Cook Co., Detroit, will require 1200 tons of reinforcing bars. Small lots are in fair demand. Weakness has appeared in prices on jobbers' stocks. Rail steel bars are firmer, being quoted at a minimum of 1.80c.

Warehouse Business.—Jobbers are doing a good volume of business, and their September sales show a gain over August. Prices are unchanged.

Coke.—A 50c. advance to $7.50, ovens, has been made on Ohio by-product foundry coke for October shipment. Ohio by-product domestic coke has advanced $1 a ton to $5.50 for nut size, or the same price as on egg coke. Connellsville coke is unchanged at $4.75 to $5, ovens, for foundry grades and $3.75 to $4 for heating coke.

Old Material.—There is still practically no consumer demand and this is reflected in a further decline in prices on nearly all grades. There is some attempt by dealers to move material by making further price concessions. Some of the local mills are still holding up shipments on borings and turnings, which is having a depressing effect on these grades. However, there is a little activity in machine shop turnings for delivery to a local mill, for which dealers are paying $13. Heavy melting steel has declined in the Valley district to $18 and compressed sheet steel to $16.50, delivered. The Hudson Motor Car Co., Detroit, received bids Saturday for 2500 tons of scrap, mostly in borings and turnings, and other Detroit automobile companies have issued scrap lists covering their October production.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	$16.50 to $16.75
Rails for rolling	16.75 to 17.00
Rails under 3 ft	18.75 to 19.00
Low phosphorus melting	17.25 to 18.00
Cast iron borings	13.25 to 13.50
Machine shop turnings	12.00 to 12.50
Mixed borings and short turnings	13.25 to 13.50
Compressed sheet steel	14.00 to 14.50
Railroad wrought	13.50 to 14.00
Railroad malleable	19.00 to 19.50
Light bundled sheet stampings	11.25 to 11.50
Steel axle turnings	14.75 to 15.25
No. 1 cast	18.00 to 18.50
No. 1 busheling	13.00 to 13.25
Drop forge flashings	12.50 to 13.00
Railroad grate bars	13.50 to 13.75
Stove plate	13.50 to 13.75
Pipes and flues	10.50 to 11.00

Philadelphia

Pig Iron Advance Barely Holding—Good Month in Steel

PHILADELPHIA, Sept. 29.—September steel business has shown a slight gain over August with the possible exception of plates, demand for which is still lagging far behind the capacities of Eastern mills. Plate prices are easier, fourth quarter contracts having been entered into at 1.70c. and 1.75c., Pittsburgh basis. The 1.70c. price, however, is being given mostly on desirable lots for prompt specification.

Pig iron business is quiet, most consumers having covered for the fourth quarter before the recent advance of 50c. a ton. This advance is not holding firmly in all instances, particularly where eastern Pennsylvania furnaces are obliged to meet the competition of Buffalo furnaces in neutral territory or where foreign iron is a factor. In scrap the situation is unchanged, brokers and dealers being in the position of waiting for further evidence of buying interest on the part of the mills. Meanwhile heavy melting steel is being sold in small lots at $17, delivered, though brokers are holding for $17.50.

Except on bars, steel prices show no strength and in several cases, notably on plates, shapes, sheets, cold finished steel bars and wire nails, are easier. Structural shapes have been sold by a nearby mill at a price equivalent to 1.75c., Pittsburgh.

Pig Iron.—The recent advance by eastern Pennsylvania furnaces to a $21 base on foundry iron has not held firmly in all instances. On a sale to a Newark, N. J., melter an eastern Pennsylvania furnace was given the opportunity to meet a Buffalo delivered price which worked back to $20.64 eastern Pennsylvania furnace and is reported to have met this competition. The competition of foreign iron has also been a factor in making it difficult for the furnaces of this district to maintain the advance. Some furnaces are fairly well sold up for fourth quarter and are indifferent to overtures for concessions, but one or two makers with free tonnage are not disposed to let the more desirable orders get away from them. A nearby manufacturer of wire rope has bought about 2000 tons of foreign low phosphorus iron at a price which discouraged domestic furnaces. Although $24, c.i.f., Philadelphia, duty paid, is the usual quotation on foreign low phosphorus iron, this price was shaded to quite an extent on this order.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$21.76 to $22.13
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.26 to 22.63
East. Pa. No. 1X	22.76 to 23.13
Virginia No. 2 plain, 1.75 to 2.25 sil.	27.67 to 28.67
Virginia No. 2X, 2.25 to 2.75 sil.	28.17 to 29.17
Basic delivery eastern Pa.	21.00 to 21.50
Gray forge	21.00 to 22.00
Malleable	22.25 to 22.75
Standard low phos. (f.o.b. furnace)	22.00 to 24.00
Copper bearing low phos. (f.o.b. furnace)	22.50 to 23.50

Ferroalloys.—While there is a fair number of scattered orders for ferromanganese, buyers usually take not more than a carload at a time. Both importers and the domestic producers continue to quote $115, seaboard or furnace.

Billets.—Small sales of rerolling and forging billets have been made at $35, Pittsburgh, for the former and $40, Pittsburgh, for the latter.

Plates.—A large producer of plates has circularized its trade that it will accept fourth quarter contracts at 1.75c., Pittsburgh. A few contracts have been entered into by one or two mills at 1.70c., and this price is also quite easily obtainable on desirable lots for prompt specifications. The demand for plates in September slightly exceeded the August volume with one or two mills, but this has not been general. Eastern mills continue to operate at 35 to 50 per cent. The Newport News Shipbuilding & Dry Dock Co. will fabricate a part of a pipe line near San Francisco requiring about 75,000 tons of plates.

Structural Material.—A nearby structural mill has made low prices in some instances for delivery in Philadelphia or vicinity, some of these quotations being the equivalent of 1.75c., Pittsburgh. Mill quotations have ranged from 1.95c. to 2.05c., f.o.b. mill. Some of the large producers hold firmly to 1.90c., Pittsburgh. The leading independent fabricating interest has six months' work on its books and other shops are also well filled for the next few months, and as a result prices on fabricated work are slightly higher.

Bars.—The leading producers of steel bars have withdrawn quotations of 1.90c., Pittsburgh, and 2c. is reported to be minimum on fourth quarter business. Some consumers were covered until the end of the third quarter at 1.90c., but have been notified that new contracts will not be below 2c. The demand for steel bars has been fairly good, some mills quoting deliveries of three or four weeks. Bar iron remains at 2.12c. to 2.22c., Philadelphia.

Sheets.—While contracts for blue annealed sheets for fourth quarter have been entered into at 2.25c., orders for early delivery have been placed at 2.20c. where the size of the tonnage and the gages were desirable from the mill viewpoint. On black sheets not more than 3.10c., Pittsburgh, is now obtainable and a few sales have been made at 3c. Some mills have abandoned efforts to obtain 4.30c. on galvanized sheets and sales are being made for early delivery or for fourth quarter requirements at 4.20c. Scattered sales at 4.10c. are reported.

Warehouse Business.—Prices for local delivery are unchanged as follows:

Soft steel bars and small shapes, 3.20c.; iron bars (except bands), 3.20c.; round edge iron, 3.50c.; round edge steel, iron finished, 1½ x ½ in., 3.50c.; round edge steel planished, 4.30c.; tank steel plates, ¼ in. and heavier, 2.80c. to 3c.; tank steel plates, ⅜ in., 3c.; blue annealed steel sheets, No. 10 gage, 3.35c.; black sheets, No. 28 gage, 4.35c.; galvanized sheets, No. 28 gage, 5.45c.; square, twisted and deformed steel bars, 3c.; structural shapes, 2.75c. to 2.90c.; diamond pattern plates, ¼ in., 5.30c.; ⅜ in., 5.50c.; spring steel, 5c.; rounds and hexagons, cold-rolled steel, 4c.; squares and flats, cold-rolled steel, 4.50c.; steel hoops, 4.25c. base; steel bands, No. 12 gage to ⅞ in., inclusive, 3.90c.; rails, 3.20c.; tool steel, 8.50c.; Norway iron, 6.50.

(*Concluded on page* 930)

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin (Spot)	Lead		Zinc	
Sept.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
23.....	14.75	14.37½	58.75	9.55	9.25	8.22½	7.87½
24.....	14.75	14.37½	58.75	9.55	9.25	8.22½	7.87½
25.....	14.75	14.37½	58.50	9.55	9.25	8.22½	7.87½
26.....	14.62½	14.25	....	9.55	9.25	8.22½	7.87½
28.....	14.62½	14.12½	58.87½	9.55	9.25	8.20	7.85
29.....	14.62½	14.12½	59.12½	9.55	9.25	8.17½	7.82½

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Sept. 29.

The markets are all very quiet and prices are tending downward. Copper is weaker as a result of light demand. The tin market has experienced one of its quietest weeks. Conditions in the lead market are unchanged. Zinc has been the strongest market, but is a little weaker.

Copper.—The electrolytic copper market is practically dominated by speculative conditions. Consumers are taking very little interest and buying has been very light. Speculators, on the other hand, as often happens at the end of the month, are active in straightening their accounts and have been obliged to offer the metal at concessions. The London market also has receded almost every day, affecting prices here. Electrolytic copper is available at 14.37½c. to 14.50c., delivered up to the end of the year, with reports that the metal has been available as low as 14.25c., delivered, or 14c., refinery. So little business is being done that these prices are largely nominal. The statistical position of the market is so strong that better conditions are expected after the turn of the month. Lake copper is quoted at 14.62½c., delivered.

Tin.—Sales of Straits tin during the week have been down to a minimum, the total not exceeding 400 tons. Yesterday, because of the Jewish holiday, the market was stagnant and today a fair business was done. Consumers continue to show no interest, and dealers are disinclined to trade. The market, however, is statistically strong, which tends to accentuate the stagnation. Spot Straits tin today was quoted at 59.12½c., New York. Prices in London today were about £3 per ton higher than a week ago, with spot standard quoted at £264 17s. 6d., future standard at £265 7s. 6d. and spot Straits £272 7s. 6d. The Singapore price was £271. Arrivals thus far this month have been 4795 tons with 6060 tons reported afloat.

Lead.—Conditions in this market are unchanged. The leading refiner continues to quote 9.50c., New York, as its contract price, and the principal producer in the West is quoting 9.25c., St. Louis. The market is steady and quiet and devoid of features.

Zinc.—The market has been consistently strong until within the last day or so, when slightly lower prices in London were reflected here. Consumers are not active buyers, neither are sellers pressing the market, but the undertone is firm, due to the satisfactory state of stocks. Prime Western for early delivery is quoted at 7.82½c. to 7.85c., St. Louis, or 8.17½c. to 8.20c., New York.

Old Metals.—Business is quiet and is practically unchanged. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible	14.25
Copper, heavy and wire	13.25
Copper, light and bottoms	11.50
Heavy machine composition	10.25
Brass, heavy	8.75
Brass, light	7.75
No. 1 red brass or composition turnings	9.75
No. 1 yellow rod brass turnings	9.50
Lead, heavy	8.50
Lead, tea	7.00
Zinc	5.25
Cast aluminum	20.50
Sheet aluminum	20.50

Nickel.—Ingot nickel in wholesale lots is quoted at 34c. with shot nickel at 35c. Electrolytic nickel is quoted at 38c.

Antimony.—Wholesale lots of Chinese metal for spot delivery are quoted at 17.25c., New York, duty paid. Metal for September-October arrival is quoted at 17c., duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is unchanged at 27c. to 28c. per lb., duty paid.

Chicago

SEPT. 29.—Lake copper has declined slightly because of decreased demand. Tin has advanced in a more active market, and zinc remains unchanged. Both lead and antimony have declined as the result of a freer supply. No changes in the prices of old metals have occurred. We quote in carload lots: Lake copper, 14.75c.; tin, 60.50c.; lead, 9.35c.; zinc, 7.90c.; in less than carload lots, antimony, 18.50c. On old metals we quote copper wire, crucible shapes and copper clips, 11.50c.; copper bottoms, 10c.; red brass, 9c.; yellow brass, 7.75c.; lead pipe, 8c.; zinc, 4.50c.; pewter, No. 1, 32.50c.; tin foil, 41c.; block tin, 46c.; all being dealers' buying prices for less than carload lots.

Ancillary Receivers Appointed for Bolt and Nut Company

The Federal District Court at Trenton, N. J., has appointed Justin C. Burns, Philadelphia, and former Judge Charles F. Lynch, of New Jersey, as ancillary receivers in equity for the Hoopes & Townsend Corporation, Philadelphia, a company having several bolt and nut plants, enumerated in these pages in August when the Hoopes & Townsend works were merged with the American Bolt Corporation, of which Mr. Burns was president. The application for receivership was made by Harley E. Burns, Columbus, Ohio, a stockholder and secretary-treasurer, who claims that the concern has been operating at a loss. The liabilities are listed at $860,000 with quick assets of $1,328,000. Justin C. Burns and Harley E. Burns are the principal stockholders and are president and secretary of the corporation, respectively.

Arcade Malleable Iron Co. Changes

WORCESTER, Sept. 29.—The business of the Arcade Malleable Iron Co., Worcester and Springfield, Mass., has been reorganized and the Springfield plant has been taken over by a new corporation known as the Arcade Smelting & Refining Co., which will produce non-ferrous metals, specializing in type metals, babbitt and hard and soft leads. The Arcade Malleable Iron Co. will continue to manufacture malleable castings at Worcester. The Springfield plant, formerly owned and operated by the Springfield Malleable Iron Co., had been idle for some time, the business having been concentrated at Worcester. The consolidation was effected about two years ago, when the Arcade company purchased the Worcester business from the Baldwin Chain & Mfg. Co., which had conducted it as a department under the Arcade name.

Under the new plan the Arcade Malleable Iron Co. will continue under the management of Henry P. Blumenauer, who remains the president. The other officers are: Vice-president, William E. Dunham, Boston; treasurer, William J. Conlon; directors, the above officers and Walter Tufts, John F. Tinsley, George A. Gaskill, J. Verner Critchley, and Frank A. Drury, all of Worcester; Frank J. Weschler and John M. Collins, Springfield, and Joseph B. Hoyt, Jr., Charles L. Stevens, Bowen Tufts and Arnold Whittaker, Boston.

The Arcade Smelting & Refining Co. will be managed by Joseph B. Hoyt, Jr., who has had long experience in the non-ferrous metal business. The officers are: President, Henry P. Blumenauer; vice-presidents, Joseph B. Hoyt, Jr., John A. West, Boston, and William E. Dunham; treasurer, William J. Conlon; directors, the officers and John F. Tinsley, Charles L. Stevens, Walter Tufts, Bowen Tufts, John M. Collins and Frank J. Weschler.

Prices of Finished Iron and Steel Products (Carload Lots)

Tank Plates

F.o.b. Pittsburgh mill, base, per lb.....1.80c. to 1.90c.
F.o.b. Chicago, base, per lb.....2.10c.

Structural Shapes

F.o.b. Pittsburgh mill, base, per lb.....1.90c. to 2c.
F.o.b. Chicago, base, per lb.....2.10c.

Iron and Steel Bars

Soft steel bars, f.o.b. P'gh mills, base, per lb.....2c.
Soft steel bars, f.o.b. Chicago, base, per lb.....2.10c.
Reinforcing steel bars, f.o.b. P'gh mills, per lb....1.90c. to 2c.
Rail steel bars, f.o.b. Chicago and f.o.b. Chicago district mills, base, per lb.....2.00c.
Common iron bars, f.o.b. Chicago, base, per lb..1.90c. to 2.00c.
Refined iron bars, f.o.b. P'gh mills, base, per lb.....3.00c.
Common iron bars, eastern Pa. mill, base, per lb.....2.10c.

Hot-Rolled Flats

Hoops, base (6 in. and narrower), per lb., Pittsburgh..2.40c.
Bands, base (6 in. and narrower), per lb., Pittsburgh..2.40c.
Strips, 6 in. and narrower, base, per lb., Pittsburgh....2.40c.
Strips wider than 6 in., base, per lb., Pittsburgh.....2.20c.
Strips, 6 in. and narrower, Chicago.....2.40c. to 2.50c.
Strips, wider than 6 in., Chicago.....2.30c. to 2.40c.
Cotton ties, per 45 lb. bundle, f.o.b. Atlantic ports.....$1.28
Cotton ties, per 45 lb. bundle, f.o.b. Gulf ports..... 1.25

Cold-Finished Steel

Screw stock and shafting, f.o.b. P'gh mills, base, per lb..2.40c.
Screw stock and shafting, f.o.b. Chicago, base, per lb...2.40c.
Screw stock, base, per lb., Cleveland.....2.45c. to 2.55c.
Shafting, ground, f.o.b. mill, base, per lb.....*2.80c. to 3.00c.
Strips, f.o.b. P'gh mills, base, per lb.....3.75c.
Strips, f.o.b Cleveland mills, base, per lb.....3.75c.
Strips, delivered Chicago, base, per lb.....4.05c.
Strips, f.o.b. Worcester mills, base, per lb.....3.90c.

*According to size.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per keg.....$2.65
Galvanized nails, 1-in. and longer, base plus..... 2.00
Galvanized nails, shorter than 1 in., base plus..... 2.25
Bright plain wire, base, No. 9 gage, per 100 lb..... 2.50
Annealed fence wire, base, per 100 lb..... 2.65
Spring wire, base, per 100 lb..... 3.50
Galvanized wire, No. 9, base, per 100 lb..... 3.10
Galvanized barbed, base, per 100 lb..... 3.35
Galvanized staples, base, per keg..... 3.35
Painted barbed wire, base, per 100 lb..... 3.10
Polished staples, base, per keg..... 3.10
Cement coated nails, base, per count keg..... 1.85
*Bale ties, carloads, to jobbers....75, 15 and 5 per cent off list
*Bale ties, carloads, to retailers...75, 10 and 6 per cent off list
Woven wire fence, base, per net ton to retailers.....$65

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., mill $3 a ton higher on production of that plant, and Duluth, Minn., mills $2 a ton higher; Anderson, Ind., $1 higher.

*F.o.b. Cleveland.

Sheets

Blue Annealed

(base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh.....2.25c. to 2.30c.
Nos. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills, 2.40c. to 2.45c.

Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh.....3.10c. to 3.15c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill..3.30c. to 3.35c.

Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh.....4.20c. to 4.30c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill..4.35c. to 4.40c.

Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh.....3.10c. to 3.15c.
No. 28 (base) per lb., f.o.b. Chicago dist. mill..3.30c. to 3.35c.

Automobile Body Sheets

No. 22 (base) per lb., f.o.b. Pittsburgh.....4.25c.

Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill..4.60c. to 4.75c.

Tin Plate

Standard cokes, per base box, f.o.b. Pittsburgh district mills.....$5.50
Standard cokes, per base box f.o.b. Chicago district mills 5.60
Standard cokes, per base box f.o.b. Elwood, Ind..... 5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base.....$11.20	20-lb. coating I. C....$15.50
8-lb. coating I. C.... 11.50	25-lb. coating, I. C.... 17.00
15-lb. coating I. C.... 14.35	30-lb. coating I. C.... 18.35
	40-lb. coating, I. C.... 20.35

Rivets

Large, f.o.b. P'gh and Cleveland mills, base, per 100 lb., $2.40 to $2.50
Large, f.o.b. Chicago, base, per 100 lb..... 2.60 to 2.65
Small, f.o.b. Pittsburgh.....70, 10 and 5 per cent off list
Small, Cleveland .....70, 10 and 5 per cent off list
Small, Chicago .....70, 10 and 10 per cent off list

Rails and Track Equipment

(F.o.b.)

Rails, standard, per gross ton.....$43.00
Rails, light, billet, base, per lb.....1.65c. to 1.70c.
Rails, light rail steel, base, per lb.....1.50c. to 1.60c.
Spikes, ⅜ in. and larger, base, per 100 lb.....$2.80 to $3.00
Spikes, ⅞ in. and smaller, base, per 100 lb..... 3.00 to 3.25
Spikes, boat and barge, base, per 100 lb..... 3.25
Track bolts, all sizes, base, per 100 lb..... 3.90 to 4.25
Tie plates, per 100 lb..... 2.35 to 2.40
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜.....	+11	+39
¼ to ⅜.....	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½.....	30	13
1 to 3.....	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6.....	59	47½	2½	26	11
7 and 8.....	56	43½	3 to 6.....	28	13
9 and 10.....	54	41½	7 to 12.....	26	11
11 and 12...	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	2 to 3.....	61	50½
¼ to ⅜.....	47	30½	¼ to ⅜.....+11		+54
½	53	42½	½	21	7
¾	58	47½	¾	28	12
1 to 1½.....	60	49½	1 to 1½.....	30	14

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4.....	57	46½	2½ to 4.....	29	15
4½ to 6.....	56	45½	4½ to 6.....	28	14
7 to 8.....	52	39½	7 to 8.....	21	7
9 and 10....	45	32½	9 to 12.....	16	2
11 and 12...	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1½ point, with supplementary discount of 5 per cent. On iron pipe, both black and galvanized, the preferentials to large jobbers are 1, 5 and 2½ per cent beyond the above discount.

NOTE—The above discounts on steel pipe also apply at Lorain, Ohio. Chicago district mills have a base 2 points less. Chicago delivered base 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point having the lowest rate to destination.

Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel		*Charcoal Iron*	
2 to 2¼ in.....	27	1½ in. .....+18	
2½ to 2¾ in.....	37	1¾ to 1⅞ in.....+ 8	
3 in.	40	2 to 2¼ in.....— 2	
3¼ to 3¾ in.....	42½	2½ to 3 in.....— 7	
4 to 13 in.....	46	3¼ to 4½ in.....— 9	

Beyond the above discounts, 5 to 6 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes Cold Drawn

1 in.	60	3 in.	45
1¼ and 1½ in.....	52	3¼ to 3½ in.....	47
1¾ in.	36	4 in.	50
2 to 2¼ in.....	31	4½, 5 and 6 in.....	45
2½ and 2¾ in.....	39		

Hot Rolled

2 and 2¼ in.....	34	3¼ to 3½ in.....	50
3½ and 2¾ in.....	42	4 in.	53
3 in.	48	4½, 5 and 6 in.....	48

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing (New List)

Carbon 0.10 to 0.30 base.....50 to 55 per cent off list
Carbon 0.30 to 0.40 base.....45 to 50 per cent off list

Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

Prices of Iron and Steel Products and Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 51.50 per cent iron	$4.55
Old range non-Bessemer, 51½ per cent iron	4.40
Mesaba Bessemer, 51.50 per cent iron	4.40
Mesaba non-Bessemer, 51.50 per cent iron	4.25
High phosphorus iron, 51.50 per cent	4.15

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	9.50c. to 10c.
Iron ore, Swedish, average 66 per cent iron	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus	45c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates	$12.00 to $13.00
Chrome ore, Indian basic, 48 per cent Cr_2O_3, crude, per ton, c.i.f., Atlantic seaboard	20.50 to 24.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	65c. to 70c.

Coke and Coal

(Per Net Ton)

Furnace coke, f.o.b. Connellsville prompt	$3.50 to $3.65
Foundry coke, f.o.b. Connellsville prompt	4.25 to 5.00
Mine run steam coal, f.o.b. W. Pa. mines	1.50 to 2.10
Mine run coking coal, f.o.b. W. Pa. mines	1.65 to 1.90
Mine run gas coal, f.o.b. W. Pa. mines	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines	1.25 to 1.35
Gas slack, f.o.b. W. Pa. mines	1.50 to 1.60

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	$115.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid	115.00
Ferrosilicon, 50 per cent, delivered	82.50 to 85.00
Ferrosilicon, 75 per cent	145.00 to 147.50
Ferrotungsten, per lb. contained metal	1.15 to 1.20
Ferrochromium, 4 per cent carbon and up, 60 to 70 per cent Cr., per lb. contained Cr. delivered	11.50c.
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent, $31.00 to $33.00
Spiegeleisen, domestic, 16 to 19 per cent, 30.00 to 32.00
Ferrosilicon, Bessemer, 10 per cent, $32; 11 per cent, $34.50; 12 per cent, $36.50 to $37; electric furnace ferrosilicon, 10 per cent, $38 furnace; 11 per cent, $38; 12 per cent, $38; 14 to 16 per cent, $45.
Silvery iron, 6 per cent, $25; 7 per cent, $26; 8 per cent, $27; 9 per cent, $28.50; 10 per cent, $30.50; 11 per cent, $32.50; 12 per cent, $34.50.

Fluxes and Refractories

Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, gravel, per net ton, f.o.b. Illinois and Kentucky mines	$16.00
No. 2 lump, per net ton	19.00
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per net ton	16.00
Fluorspar, No. 1 ground bulk, 95 to 98 per cent calcium fluoride, not over 2½ per cent silica, per net ton, f.o.b. Illinois and Kentucky mines	32.50

Per 1000 f.o.b. works:

Fire Clay	High Duty	Moderate Duty
Pennsylvania	$43.00 to $46.00	$40.00 to $43.00
Maryland	48.00 to 50.00	42.00 to 45.00
Ohio	43.00 to 46.00	40.00 to 43.00
Kentucky	43.00 to 45.00	40.00 to 43.00
Illinois	43.00 to 45.00	40.00 to 43.00
Missouri	40.00 to 43.00	35.00 to 38.00
Ground fire clay, per ton		6.50 to 7.50
Silica Brick:		
Pennsylvania		40.00
Chicago		49.00
Birmingham		54.00
Silica clay, per ton		8.00 to 9.00
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)		65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		40.00
Chrome Brick:		
Standard size, per net ton		48.00

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

Machine bolts, small rolled threads..60 and 10 per cent off list
Machine bolts, all sizes, cut threads, 50, 10 and 10 per cent off list
Carriage bolts, smaller and shorter, rolled threads, 50, 10 and 10 per cent off list
Carriage bolts, cut threads, all sizes..50 and 10 per cent off list
Eagle carriage bolts..65 and 10 per cent off list
Lag bolts..60, 10 and 10 per cent off list
Plow bolts, Nos. 2 and 7 heads..50 and 10 per cent off list
Other style heads..20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in., 45, 10 and 5 per cent off list
Larger and longer sizes..45, 10 and 5 per cent off list
Hot-pressed nuts, blank and tapped, square..4c. off list
Hot-pressed nuts, blank or tapped, hexagons..4.40c. off list
C.p.c. and t. square or hex. nuts, blank or tapped..4.10c. off list
Bolt ends with hot pressed nuts..50, 10 and 10 per cent off list
Bolt ends with cold pressed nuts..45, 10 and 5 per cent off list
Washers*..6.50c. to 6.25c. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent less than above for less than car lots. On hot pressed and cold punched nuts the discount is 25c. less per 100 lb. than quoted above for less than car lots.

(Quoted with freight allowed within zone limits)

Semi-finished hex. nuts:
⅞ in. and smaller, U. S. S..80, 10 and 5 per cent off list
⅞ in. and larger, U. S. S..75, 10 and 5 per cent off list
Small sizes, S. A. E..80, 10, 10 and 5 per cent off list
S. A. E., ¾ in. and larger..75, 10, 10 and 5 per cent off list
Stove bolts in packages..80, 10 and 5 per cent off list
Stove bolts in bulk..80, 10, 5 and 2½ per cent off list
Tire bolts..60 and 5 per cent off list

Semi-Finished Castellated and Slotted Nuts

(Prices delivered within specified territories)
(To jobbers and consumers in large quantities)

	Per 100 Net S. A. E.	Per 100 Net U. S. S.		Per 100 Net S. A. E.	Per 100 Net U. S. S.
¼-in.	$0.44	$0.44	¾-in.	$2.35	$2.40
5/16-in.	.515	.515	⅞-in.	3.60	3.60
⅜-in.	.62	.66	1-in.	5.65	5.80
7/16-in.	.79	.90	1⅛-in.	8.90	8.90
½-in.	1.01	1.05	1¼-in.	12.60	13.10
9/16-in.	1.38	1.42	1⅜-in.	18.35	18.35
⅝-in.	1.70	1.73	1½-in.	21.00	21.00

Larger sizes—Prices on application.

Cap and Set Screws

(Freight allowed within zone limits)

Milled cap screws..80, 10 and 5 per cent off list
Milled standard set screws, case hardened, 80 and 10 per cent off list
Milled headless set screws, cut thread, 80 and 10 to 80 per cent off list
Upset hex. head cap screws, U. S. S. Thread, 80, 10, 10 and 5 per cent off list
Upset hex. cap screws, S. A. E. Thread 80, 10 and 5 per cent off list
Upset set screws..80, 10 and 10 per cent off list
Milled studs..75 per cent off list

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over	$33.50 to $35.00
Forging billets, ordinary	40.00
Forging billets, guaranteed	45.00
Sheet bars	35.00
Slabs	$33.50 to 35.00
*Wire rods, common soft, base, No. 5 to ⅜-in.	45.00
Wire rods, common soft, coarser than ⅜-in.	$2.50 over base
Wire rods, screw stock	$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75	7.50 per ton over base
Wire rods, carbon over 0.75	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.	1.90c.
Skelp, sheared, per lb.	1.90c.
Skelp, universal, per lb.	1.90c.

*Chicago mill base is $46. Cleveland mill base, $45.

Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E. Series Numbers	Bars 100 lb.
2100* (½% Nickel, 10 to 20 per cent Carbon)	$3.00 to $3.25
2300 (3% Nickel)	4.50 to 4.75
2500 (5% Nickel)	5.75 to 6.00
3100 (Nickel Chromium)	3.50 to 3.65
3200 (Nickel Chromium)	5.00 to 5.25
3300 (Nickel Chromium)	7.50 to 7.75
3400 (Nickel Chromium)	6.25 to 6.50
5100 (Chromium Steel)	3.25 to 3.50
5200* (Chromium Steel)	7.50 to 8.00
6100 (Chromium Vanadium bars)	4.25 to 4.50
6100 (Chromium Vanadium spring steel)	4.00 to 4.25
9250 (Silicon Manganese spring steel)	3.25 to 3.50
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium)	4.00 to 4.25
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	4.25
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	3.60 to 3.75
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for coal drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

STRUCTURAL STEEL

Bookings, Including Pacific Coast Pipe Line, Over 106,000 Tons

Including the 75,000 tons for the steel plate pipe line for Oakland, Cal., awards of fabricated steel work reported for the past week total over 106,000 tons or by far the largest amount for a week in many months. Bookings for industrial buildings called for nearly 7000 tons, for general public enterprises over 6500 tons, for hotels and apartment buildings 7750 tons and for business buildings 4200 tons. Railroad takings were 2700 tons. Fresh inquiries covered 20,500 tons. Awards include:

New York subways, 5700 tons, to American Bridge Co.; Frederick L. Cranford Co., general contractor.

Church building, 102 East Sixty-eighth Street, New York, 200 tons, to Bethlehem Fabricators, Inc.

Apartment building, 1035 Park Avenue, New York, 600 tons, to Bethlehem Fabricators, Inc.

Cortlandt-Bishop apartment building, 101 West Fifty-fifth Street, New York, 2100 tons, to Shoemaker Bridge Co.

Hotel, 112 West Fifty-ninth Street, New York, 1500 tons, to Easton Structural Steel Co.

Apartment building, 42 West Fifty-eighth Street, New York, 1000 tons, to Easton Structural Steel Co.

Garage, 134th Street, New York, 1000 tons, to Shoemaker Bridge Co.

Shelburne Hotel, Atlantic City, N. J., addition, 1100 tons, to Shoemaker Bridge Co.

Hospital, Elmira, N. Y., 400 tons, to American Bridge Co.

Power plant, Beaumont, Tex., 900 tons, to a local fabricator.

Pennsylvania Railroad, bridge at Louisville, Ky., 200 tons, to Belmont Iron Works.

Columbia-Presbyterian Hospital, New York, power house, 475 tons, to Post & McCord.

Hotel Pennsylvania, Atlantic City, N. J., 1300 tons, to McClintic-Marshall Co.

Atlantic Coast Line, bridge, 150 tons, to American Bridge Co.

Erie Railroad, bridge, 250 tons, to Bethlehem Steel Corporation.

College of Mount St. Michaels, New York, 500 tons, to Easton Structural Steel Co.

Loft building, West Thirty-sixth Street, New York, 400 tons, to Taylor-Fichter Steel Construction Co.

National Quarries Co., Carey, Ohio, 150 tons, to unnamed fabricator.

Southern Indiana Gas & Electric Co., gas holder at Evansville, Ind., 200 tons, to Stacey Brothers Gas Construction Co.

Ansonia Copper & Iron Works, Cincinnati, two fermenter tanks at Terre Haute, Ind., to Stacey Brothers Gas Construction Co.

Upson Nut Co., Cleveland, extension, 100 tons, to Jones & Laughlin Steel Corporation.

Theater, Hammond, Ind., 800 tons, to United Boiler, Heating & Foundry Co., Hammond.

Theater, Madison, Wis., 760 tons, to Gage Structural Steel Co.

Grand Rapids Trust Building, Grand Rapids, Mich., 960 tons, to Whitehead & Kales Iron Works.

Budd Wheel Corporation, Philadelphia, branch plant at Detroit, 180 tons, to Russell Wheel & Foundry Co.

Gas holder, Hornell, N. Y., 500 tons, to Stacey Brothers Gas Construction Co.

Chicago & Western Indiana Railroad Co., platform canopies for Dearborn Station, Chicago, 225 tons, to American Bridge Co.

Receivers, Chicago, St. Paul & Milwaukee Railroad, riveted truss span near Marquette, Iowa, 165 tons, to American Bridge Co.

Swift & Co., Chicago, building, 104 tons, to New City Iron Works.

Miscellaneous small contracts aggregating 500 tons, to Vincennes Bridge Co.

Newport Turpentine & Resin Co., Bay Minette, Ala., plant addition, 200 tons to Worden-Allen Co.

Long-Bell Lumber Co., Longview, Wash., power house, 175 tons, to Worden-Allen Co.

Apartment, Turk Street, San Francisco, 150 tons, to Central Iron Works.

Hospital, Bellvue and Waterloo Streets, Los Angeles, 400 tons, to Baker Iron Works.

South San Joaquin Irrigation District, Manteca, Cal., 325 tons, to Moore Dry Dock Co.

Sutherland, Ore., pipe line, 300 tons, to Coast Culvert & Flume Co.

Pan-American Petroleum & Transport Co., Los Angeles, 180 tons, to Steel Tank & Pipe Co.

General Petroleum Co., San Francisco, 1500 tons, to two unnamed Eastern mills.

East Bay Municipal Utility District, Oakland, Cal., 75,000 tons; Twohy Brothers awarded general contract. Pipe line to be fabricated by Steel Tank & Pipe Co. and Newport News Shipbuilding & Dry Dock Co., plates placed with Carnegie Steel Co.

Valley Mold & Iron Corporation, South Chicago, foundry, 1050 tons, to McClintic-Marshall Co.

Chesapeake & Ohio Railroad, Sciotoville, Ohio, bridge, 1400 tons, to McClintic-Marshall Co.

R. D. Wood & Co., foundry at Florence, N. J., 200 tons, to Austin Co.

Reading Co., elevator at Port Richmond, 2500 tons, to Bethlehem Fabricators, Inc.

Pennsylvania Railroad, bridge in Ohio, 150 tons, to Penn Bridge Co.

Easton, Pa.-Phillipsburg, N. J., bridge, 150 tons, to American Bridge Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

New York subways, section on Eighth Avenue from Thirty-eighth to Forty-seventh Street, 5500 tons; bids close Oct. 6.

Overman Tire Co., building at Belleville, N. J., 250 tons.

W. & J. Sloane Mfg. Co., addition to plant now under construction at Trenton, N. J., 600 tons.

Office building for Arthur Brisbane, East Fifty-seventh Street, New York, 700 tons.

Highway bridge, Philadelphia, 250 tons.

Power plant at West Pittston, Pa., 1800 tons.

Harriman Building, Fifth Avenue and Forty-fourth Street, New York, 6000 tons.

Dade County Courthouse, Miami, Fla., 2200 tons, general contract to L. W. Hancock.

Federal Rubber Co., Cudahy, Wis., 600 tons.

Lake Shore Athletic Club, Chicago, 3500 tons.

Standard Oil Co., addition to building, South Michigan Avenue, Chicago, 700 tons.

RAILROAD EQUIPMENT

Orders for 1400 Cars and 1500 Bodies and for 58 Locomotives

Railroad equipment buying reported in the past week included 1250 cars, 1500 all-steel car bodies, 100 caboose cars and 58 locomotives. Fresh inquiries appeared for 1100 cars. The items include the following:

The Louisville & Nashville Railroad has ordered 1250 freight cars and 32 locomotives, as follows: 500 all-steel gondolas from the Pressed Steel Car Co.; 500 composite box cars from the Standard Tank Car Co.; 250 flat cars from the Bethlehem Steel Corporation; 24 heavy Mikado type locomotives from the American Locomotive Co.; 8 locomotives from the Baldwin Locomotive Works. The freight cars will require about 15,000 tons of steel.

The Baltimore & Ohio Railroad has contracted for 1500 all-steel box car bodies requiring 12,000 tons of plates, shapes and bars and 3000 tons of sheets. The Bethlehem Steel Corporation will build 1000 and the Standard Steel Car Co. 500.

In addition to 50 heavy Mikado locomotives ordered from the American Locomotive Co., reported in THE IRON AGE last week, the Chesapeake & Ohio has ordered 20 locomotives from the Baldwin Locomotive Works. This road has also ordered 100 caboose cars from the Standard Tank Car Co.

Armour & Co., Chicago, have ordered 300 steel underframes for beef cars from the Bettendorf Co.

The Chile Exploration Co. is in the market for 100 80-ton ore cars.

The Chicago, Wilmington & Franklin Coal Co. has ordered 40 pit cars from the American Car & Foundry Co.

The American Locomotive Co. has received an order for 1 six-wheel switching locomotive from the Richmond Car Works and 1 prairie type locomotive from the H. L. Bruce Co.

The Chicago, Burlington & Quincy is inquiring for 500 center sills for freight cars.

The Seaboard Air Line has ordered 4 locomotives from the Baldwin Locomotive Works.

The Chateaugay Ore & Iron Co. has ordered 10 steel ore cars from the American Car & Foundry Co.

The New York, New Haven & Hartford has placed 35 multi-unit passenger coaches, motor equipped, with the Osgood Bradley Car Co.

The Baltimore & Ohio is inquiring for 1000 box cars.

The Ayer & Lord Tie Co. has placed 70 tie and 10 pole cars with the Kilby Car Co.

PERSONAL

H. D. Westfall, who this week assumed his position as vice-president, Weirton Steel Co., formerly was general manager of sales, Wheeling Steel Corporation, with which he had been associated for 22 years. He has been active in the steel industry for 30 years, his first connection being with the New Philadelphia Iron & Steel Co., New Philadelphia, Ohio, of which he was assistant manager of sales when it was absorbed by the American Sheet Steel Co. in 1900. During the next three years he was with the latter company in its general sales offices in New York. He then joined LaBelle Iron Works, Steubenville, Ohio, of which he was manager of sales and also held the offices of secretary and vice-president. When LaBelle Iron Works, Wheeling Steel & Iron Co. and the Whitaker Glessner Co. were merged into the Wheeling Steel Corporation in 1920, he was transferred from Steubenville to Wheeling and in 1923 was made general manages of sales.

H. D. WESTFALL

—

Albert Walton was elected president and general manager of the J. W. Paxson Co., Philadelphia, manufacturer of foundry equipment, by the directors at a recent meeting. He succeeds H. M. Bougher, who was elected chairman of the board of directors.

—

Vaughan E. Montgomery, formerly Western sales manager of Crocker Brothers, with offices at Cincinnati, but more recently associated with the Cincinnati office of Rogers, Brown & Crocker Brothers, Inc., has resigned. He has organized the V. E. Montgomery Co. to deal in pig iron, coke, ferroalloys, metals and coal. Offices have been established at 1102 Carew Building, Cincinnati. Mr. Montgomery has been in the iron business for 17 years, having started as a molder in a steel foundry.

—

Grant C. Broomall, director of service engineering, American Rolling Mill Co., Middletown, Ohio, will leave soon for Europe to make a survey of conditions in the leading industrial nations in the Old World.

—

C. P. Clampitt has recently been made sales manager of the Burdett Mfg. Co., manufacturer of oxygen generators, 309 North St. John's Court, Chicago. He succeeds W. R. Noxon, who resigned Sept. 1.

—

L. Weimer Murray, sales manager General Refractories Co., Chicago, has returned from a vacation spent in Mexico City, Mexico, and California.

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Fred McDonel, Jr., of Lansing, Mich., has been appointed production manager of the Summitt Screw Co., 548 West Jackson Boulevard, Chicago.

—

George E. Thomas, who has been sales representative of the Gisholt Machine Co. in the New England territory for the past 10 years with headquarters in Boston, has become associated with the sales organization of the Cleveland office of the Niles-Bement-Pond Co.

—

J. S. McKesson, who has been Pittsburgh district sales manager of the McKinney Steel Co., Cleveland, and his assistant George W. Crowl, will be transferred to the company's main offices in Cleveland, Oct. 1. The company has decided to discontinue its Pittsburgh office on that date.

—

Louis Parent, prominent machine tool importer of Paris, recently visited several machine tool plants in Detroit in the interest of his company, which has branches in Italy, Belgium, Spain and Switzerland.

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R. G. Bullock, formerly chief engineer for the Art Metal Construction Co., Jamestown, N. Y., manufacturer of metal furniture, has been appointed works manager of all of the company's plants.

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Thomas E. Ward, for 20 years associated with the Stowell Co., South Milwaukee, Wis., makers of hardware specialties and malleable castings, has resigned and on Oct. 1 becomes associated with the Badger Malleable & Mfg. Co., also of South Milwaukee, as general sales manager. For several years he has been secretary of the Stowell company.

—

Albert Petsche, a director of a number of French industrial companies, including the Trefileries & Laminoirs du Havre and the Société Alsacienne de Constructions Mecaniques; Ernest Mercier, director; René Hochstetter, general manager; Edouard Roth, chief engineer, and J. F. J. Bethenod, construction engineer of the Société Alsacienne de Constructions Mecaniques, are members of a party which left France on Sept. 23 for a tour of the United States ending Nov. 6. Large power houses will be visited in part and on Oct. 6 a visit to the electrolytic iron plant at Niagara Falls is scheduled, the plant which has been promoted largely by Charles P. Perin.

—

F. J. Trippensee, president and general manager, Trippensee Closed Body Corporation, Detroit, plans to resign in the near future, to organize the Trippensee Sales & Mfg. Co., specializing in automobile, truck and motor bus woodwork. The offices of the new company will be at 2697 East Grand Boulevard, Detroit.

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O. K. Davis, secretary of the National Foreign Trade Council, is the author of "Released for Publication," published by Houghton Mifflin Co., Boston. The book deals with political incidents of the Roosevelt and Taft administrations, Mr. Davis having been for seven years of that period the Washington correspondent of the New York *Times* and secretary of the Progressive National Committee from 1912 to 1914.

—

S. L. Orr, president Orr Iron Co., Evansville, Ind., arrived in New York this week after a two months stay in Europe.

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W. S. Pilling, Philadelphia pig iron merchant, will return on Friday from a European trip.

To Canvass Steel Capacity of the Country

To canvass the capacity situation of the steel works of the country, looking to a possible revision of the steel ingot capacity records of the American Iron and Steel Institute, the directors of that body have appointed the following committee: John A. Topping, chairman Republic Iron & Steel Co., chairman; James A. Farrell, president United States Steel Corporation, and Eugene G. Grace, president Bethlehem Steel Corporation.

The Glasgow Iron Co.'s pressed steel plant at Pottstown, Pa., was severely damaged by fire Thursday, Sept. 24, but repairs will be made at once so that work may be resumed in a few weeks. The fire affected only that part of the plant devoted to the manufacture of flanged and dished boiler heads, manhole covers, pipe flanges, etc., the rolling mills being located in another building a mile distant.

Philadelphia Iron and Steel Market

(*Concluded from page 924*)

Imports.—This port shows following imports for last week. Pig iron, 100 tons from the Netherlands and 1001 tons from Calcutta; chrome ore, 4000 tons from Portuguese East Africa; manganese ore, 9930 tons from Calcutta; ferromanganese, 55 tons from England.

Old Material.—Lack of steel mill demand for heavy melting steel has caused slight further weakness in steel mill grades, but prices have shown only minor changes. Not more than $17, delivered, is obtainable for heavy melting steel, but brokers are unwilling to sell tonnages at less than $17.50. While scrap is coming out a little more freely, a good many yard dealers are holding their accumulations for a renewal of buying, which is thought to be not far off.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel	$17.00
Scrap rails	17.00
Steel rails for rolling	18.50 to 19.00
No. 1 low phos. heavy 0.04 and under	21.50 to 22.00
Couplers and knuckles	21.00 to 21.50
Rolled steel wheels	21.00 to 21.50
Cast iron car wheels	18.50 to 19.00
No. 1 railroad wrought	18.00 to 18.50
No. 1 yard wrought	17.00 to 17.50
No. 1 forge fire	14.50 to 15.00
Bundled sheets (for steel works)	14.00 to 14.50
Mixed borings and turnings (for blast furnace use)	13.50 to 14.00
Machine shop turnings (for steel works use)	14.00 to 14.50
Machine shop turnings (for rolling mill use)	14.50 to 15.00
Heavy axle turnings (or equivalent)	15.00 to 15.50
Cast borings (for steel works and rolling mill)	14.00
Cast borings (for chemical plant)	16.00 to 16.50
No. 1 cast	18.00 to 18.50
Heavy breakable cast (for steel plants)	17.00
Railroad grate bars	14.50 to 15.00
Stove plate (for steel plant use)	14.50 to 15.00
Wrought iron and soft steel pipes and tubes (new specifications)	16.50 to 17.00
Shafting	23.00 to 24.00
Steel axles	24.00 to 25.00

Foreign Inquiry Includes Barbed Wire and Rails

NEW YORK, Sept. 29.—Inquiry from the Far East continues light, but reports from Japan describe an improved condition in business as a result of slightly reduced stocks, particularly of sheets. Quotations on light gage black sheets are still $84 to $85 by American mills compared with $81.50 to $82, c.i.f. Japan, quoted by some British sellers. In addition to the small inquiries for rails from Tokio municipality and the Kei-Hin Electric Railway, bids on which will open in a few days, the Imperial Government Railways have opened bids on 1560 tons of 100-lb. rails with splice bars.

Among recent outstanding inquiries from South American consumers have been some sizable lots of barbed wire. One exporter to South America and Cuba has asked for quotations on about 30,000 spools of barbed wire and another inquiry calls for about 16,000 spools. German quotations, however, are understood to be low, evidenced by occasional offers to American consumers of barbed wire at 2.30c. to 2.40c. per lb., c.i.f. Atlantic or Gulf port. It is claimed by American exporters that a price figuring back to a little better than 2c. per lb., Pittsburgh, would be necessary to obtain the present barbed wire business in export markets.

Owing to higher prices for iron in the Chicago district, Valley sellers are receiving more inquiries from melters in that territory, and some sales are resulting. One order for 200 tons of No. 2X foundry was placed by a melter in Muskegon, Mich., at a price figuring back to $19.38, Valley furnace, while another order for 100 tons from a purchaser in the same city carried a price which figured back to $19.23, Valley furnace. An order for 200 tons of No. 2 foundry from a Marion, Ohio, consumer was booked by a merchant seller in the Valley at $18.50.

185 NAIL AND TACK SIZES

Simplified Practice Makes 57 Per Cent Reduction—Only 127 Packing Weights

WASHINGTON, Sept. 29.—Reduction from 428 to 185 in the sizes of nails and tacks, and a cut from 423 to 127 in packing weights, will be recommended at a conference of producers, distributers and users on Oct. 7 at the Department of Commerce under the auspices of the Division of Simplified Practice. Following the months spent in studying sales and demand for the various types and sizes, the proposed simplification will be submitted by a committee headed by Herbert S. Holland, vice-president and treasurer of the Shelton Tack Co., Shelton, Conn.

The manufacturers' committee favors the elimination of all special trade names, including American Cut, Swedes Cut (for which it would substitute the term "trimmers"), Sweden carpet, Baling, Canvas, Cheese Box, Curtain, Shade, Stamp, Gagers, Roofing, Lookingglass, Truckers and Berry-Box tacks. It is also proposed to redesignate the schedules, replacing numbers by fractions of an inch, and to urge that the user substitute the next longer or shorter fractional size for the item eliminated.

In the recommendation as to packing weights, the 5-lb. and 50-lb. packages would be dropped from use for any of the 29 classes and 47 types covered in the simplified practice program. The smaller size packages also would be eliminated in a number of types. The ⅛-lb. package would be dropped from 20 classes; the ¼-lb. package from 10 classes; the ½-lb. package from 15 classes, and the 1-lb. package from 11 classes. The 10-lb. package would be eliminated in 25 classes and the 25-lb. package in eight classes, if the program as prepared is adopted. The committee also is in favor of eliminating a number of types in gages which, it is stated, surveys of the committee showed to be in slight demand.

Because of the extensive use of the various types of nails and tacks by railroads, by the furniture industry, by packing, roofing, boot and shoe, trunk and luggage interests, and a number of other groups, the Division of Simplified Practice is making every effort to have a full representation of distributers and users to act on the proposed eliminations. Further interest is aroused by the 70 per cent reduction proposed in packing weights which, it is held, will affect distribution and merchandising systems in an important way.

Gear Makers Meeting at West Baden

Addresses relating to problems of the gear industry and reports of progress made by the several technical standardization committees feature the program of the semi-annual meeting of the American Gear Manufacturers Association being held at the West Baden Springs Hotel, West Baden, Ind. The meeting opened today, Oct. 1, and will continue through Saturday, Oct. 3.

"Improvements Needed in Automotive Steels" will be discussed by W. G. Hildorf, consulting metallurgist of the Reo Motor Co., Lansing, Mich. Preceding the report of the metallurgical committee, Stanley P. Rockwell, consulting metallurgist, Hartford, will speak on "The Rockwell Dilation Method for the Heat Treatment of Steel."

An address on "Recent Developments in Gear Research" will be given by C. W. Ham, associate professor of machine design, University of Illinois, Urbana, Ill. J. L. Williamson, Fellows Gear Shaper Co., Springfield, Vt., will speak on "Measuring Gear Teeth." "The Machine Hour Rate—An Ideal Foundation for Gear Prices," a paper by E. A. Kebler, president of the Fawcus Machine Co., Pittsburgh, will be presented at the opening session. A luncheon meeting, to be held Friday, Oct. 2, will be addressed by Brig. Gen. J. E. Fechet, assistant chief of air service, U. S. Army, who will speak on "Military and Commercial Aeronautics and the Problem Confronting Their Development."

Exhibit of Steel Mill Equipment

(*Concluded from page* 903)

in connection with Brown automatic control pyrometers and recording instruments. The Trent exhibit was of electric melting pots and heaters, dental vulcanizers and control appliances.

Refractories were represented by M. H. Detrick Co., Pittsburgh, and the Celite Products Co., Pittsburgh. The Detrick exhibit consisted of a model showing a flat, suspended arch, with center-slotted tile supported by castings, themselves supported from structural steel members. High temperature insulation was the burden of the Celite display, which included both brick and powdered Sil-o-Cel. The value of this material depends upon its contained dead-air cells of microscopic size. The Johns-Manville Co., New York, showed insulating material, pipe coverings, packings and asbestos shingles.

Combustion of powdered coal was taken care of by the exhibit of the Fuller-Lehigh Co., Fullerton, Pa. Models of horizontal and vertical burners, single-screw feeder, pump and conveying system, vertical waste-heat dryer, automatic switching valve and pulverizer mill were shown. An electrically heated industrial oven, exhibited by the Gehnrich Indirect Heat Oven Co., Long Island City, N. Y., was operated in conjunction with the John C. Dolph Co., Philadelphia, and the Mutual Foundry & Machine Co., Atlanta. Coil-making apparatus of the Mutual company produced coils for armatures of the Dolph company, which were baked in the Gehnrich oven. One feature was a Dolph display of a Chinalak treated motor running submerged in a 15 per cent sulphuric acid bath.

Lubricants were shown by the Keystone Lubricating Co., Philadelphia; United States Graphite Co., Saginaw, Mich., and Philadelphia Grease Mfg. Co., and a lubricating oil purifier by the Sharples Specialty Co., Philadelphia. The latter was designed to remove dirt, carbon, water emulsions, sludges and abrasive materials. The Graphite company had carbon, graphite and metal motor generator brushes on display.

Electrical Equipment

Apparatus of a myriad of types, designed for the control or use of electric current, were shown by exhibitors. Included in the list are the following well-known names:

Allen-Bradley Co., Milwaukee, motor starters.

Allis-Chalmers Mfg. Co., Milwaukee, frog leg winding for d. c. machines; squirrel cage induction motor.

Appleton Electric Co., Chicago, conduit fittings, etc.

Benjamin Electric Mfg. Co., Chicago, relays, switch boxes and lamp reflectors.

Bussman Mfg. Co., St. Louis, renewable and non-renewable fuses and plugs.

Calebaugh Self-Lubricating Carbon Co., Philadelphia, limit switches.

Chicago Fuse Mfg. Co., knife-blade renewable fuses, fuse blocks, switch boxes, outlet boxes, etc.

Corliss Carbon Co., Bradford, Pa., carbon brushes and a device for testing their resistance.

Conduit Electrical Mfg. Co., South Boston, Mass., heavy-duty truck type oil circuit breaker and truck type switchboard designed for 15,000 volts.

Craven Electric Sales Co., Philadelphia, safety switches and switch boxes, power outlets, etc.

Crocker-Wheeler Co., Philadelphia, d. c. mill motors, interpole type motor and squirrel cage motor.

Crouse Hinds Co., Syracuse, signal lights and searchlights, plug receptacles and condulets.

Cutler-Hammer Mfg. Co., Milwaukee, time limit controller for mill motors, mill controller, with 600-ampere contactors, etc.

Cutter Electric & Mfg. Co., Philadelphia, U-Re-Lite circuit breakers and their use, featuring a large switchboard.

Economy Fuse & Mfg. Co., Chicago, renewable fuses, plug fuses and cartridge fuses.

Edison Storage Battery Co., Orange, N. J., truck batteries and elements.

Electric Controller & Mfg. Co., Cleveland, safety limit stop, starting switch, automatic compensator, etc.

Electric Service Supplies Co., Philadelphia, coil winding tools, rail bonds and contact material, armature shop tools, insulators, pantagraph collectors, etc.

Electric Development & Machine Co., Philadelphia, bus supports and insulators, in connection with high-frequency oscillator.

Electric Storage Battery Co., Philadelphia, Exide batteries, both ironclad and flat plate types, and radio batteries.

Erie Malleable Iron Co., Erie, Pa., threadless conduit fitting, known as Kondu-Box.

General Electric Co., Schenectady, mill-type motor with solenoid-operated brake and several other motors, with solenoid-operated circuit breaker, 15,000-volt oil circuit breaker.

Holophane Glass Co., 342 Madison Avenue, New York, lamp shades and reflectors.

Martindale Electric Co., Cleveland, commutator stones and grinding tools, slotting tools, cement and cleaning blower.

Monitor Controller Co., Baltimore, edgewound resistor—a nickel-copper ribbon wound on edge and mounted on steel reinforced support.

Morganite Brush Co., New York, insulators and switches, carbon and graphite brushes.

Mutual Electric & Machine Co., Detroit, safety switches with interlocks and dead-front switchboards.

National Carbon Co., Cleveland, carbon, graphite and metal brushes, carbon contacts and welding carbons.

Nichols Lintern Co., Cleveland, safety lights and lanterns and an electro-magnetic sander.

Okonite Co., Passaic, N. J., rubber covered wire and cables, varnished cable, impregnated paper cables, etc.

Packard Electric Co., Warren, Ohio, transformers and tap changers.

Pittsburgh Transformer Co., model of 3-phase, 15,000-kva. self-cooled transformer, tap changer switch, etc.

Pyle National Co., Chicago, floodlights and small turbo-generators—½ to 7½ kw.—for locomotive use.

Reliance Electric & Engineering Co., Cleveland, induction motors, d. c. motor and a 1916 motor, interchangeable with 1925 design.

Roller-Smith Co., New York, four distinct types of circuit breakers, also portable indicating instruments.

Rowan Controller Co., Baltimore, controllers, featuring in particular their accessibility.

George Sachsenmaier Co., Philadelphia, motors, generators, and other power equipment at second hand.

Schweitzer & Conrad, Inc., Chicago, protective and switching equipment up to 132,000 volts, pantagraph air-break switch and safety disconnect switch.

Square D Co., Detroit, convertible power panel, voltage tester, motor starter and switches.

Stackpole Carbon Co., St. Marys, Pa., evolution of a carbon brush, with testing and control apparatus.

Standard Underground Cable Co., Pittsburgh, bare and insulated wires and cables, lead covered and armored cables and cable terminals and junction boxes.

Thompson Electric Co., Cleveland, safety lowering switches for arc lamp maintenance.

Trumbull Electric Mfg. Co., Plainville, Conn., switches of many types and standard unit panel board.

Trumbull-Vanderpoel Electric Mfg. Co., Bantam, Conn., safety switches.

V. V. Fittings Co., Philadelphia, conduit fittings and safety switches.

Westinghouse Electric & Mfg. Co., East Pittsburgh, d.c. and mill-type motors, magnetic control, static condenser for power factor correction, circuit breakers and 200-ampere portable arc welding unit.

Edwin L. Wiegand Co., Pittsburgh, "chromalox" electric strip heaters; a roll heater designed by Gordon Fox, Freyn Engineering Co., Chicago.

Steel Treaters' Annual Exposition

(*Continued from page* 905)

Three new attachments were shown in connection with the No. 3 driller of the W. B. Knight Machinery Co., St. Louis. These were a high-speed milling attachment which permits of a maximum speed of 1350 r.p.m. for die sinking and profiling operations and for brass and aluminum work on the No. 3 machine. Another was a horizontal milling attachment, and the third a shaping attachment.

Lathes exhibited in the space of the Strong, Carlisle & Hammond Company included a 22 in. by 12 ft. helical geared extra heavy-duty machine of the Monarch Machine Tool Co., Sidney, Ohio. Other lathes of the Monarch company included its Junior size, a 16 in. by 6 ft. tool room lathe and an 18 in. by 6 ft. helical geared heavy-duty manufacturing type machine.

The International Machine Tool Co., Indianapolis, had its 24-26 in. type C-7 Libby turret lathe machining locomotive cross head pins. This machine has a 7½-in. hole through the spindle and incorporates several improvements, including new thread-cutting attachment and forced-feed lubrication for the main headstock bearing and rapid traverse unit. A 42-in. gear box motor-driven boring mill of the King Machine Tool Co., Cincinnati, was also under power.

Centerless Grinder In Operation

Centerless cylindrical grinding was demonstrated on a machine of the Heim Grinder Co., Danbury, Conn., the machine being equipped with full automatic attachments and all equipment for through and shoulder grinding. Among the work done was the automatic grinding of ⅝-in. spring bolts, which were first rough ground at the rate of 8 to 9 per min., removing 0.010 in., and then finish ground to size at the rate of 11 to 12 per min. removing 0.002 in.

The new drill grinder of the Oliver Instrument Co., Adrian, Mich., referred to in the report of the New Haven machine tool exhibition in THE IRON AGE of Sept. 17, was a center of interest. This company also had a drill point-thinning machine and a die-filling machine in operation.

Among the items exhibited by the B. C. Ames Co., Waltham, Mass., was a new "Jumbo" thickness dial gage for accurate measurement of wire and other material up to ½ in. thick. Unusually large dial to facilitate readings is a feature. In addition to several other micrometer dial gages, a bench milling machine, a bench lathe and the Triplex combination lathe, milling machine and drill press were shown.

The Oilgear Co., Milwaukee, exhibited its 10-ton type P.J. press for push broaching and assembling work. The machine is equipped with semi-automatic control, motor drive, splash pan and cutting lubricant attachment. Variable speed is a feature.

Multiple Roll Mechanism for Drop Hammers

A variety of machine tools and other equipment of more than 13 manufacturers was exhibited by William K. Stamets Co., Pittsburgh. A universal die sinking machine of the Billings & Spencer Co., Hartford, was in operation and a trimming die miller shown. The company's board drop hammers were demonstrated by means of a working model, and large photographs of the new multiple roll mechanism for model E heavy-duty hammers were displayed. This mechanism is said to permit of operating 6500-lb. hammers with boards of the same size as used on the 2000-lb. single-roll hammer. The speed of the machine is 58 blows per min. Double-vee slides are employed for the upright, and wedge adjustment sidewise for the hammer. A patented die bunter for lengthwise adjustment is a feature, no bottom dowel being required. The base and uprights are of steel, the latter built in a ratio of 20 to 1 against the weight of the ram.

Two large triple combined punching and shearing machines of Henry Pels & Co., New York, were in operation punching and shearing angles, tees, bars and plate, without changing tools. An angle and tee shear with beam and channel cutter was also demonstrated.

Lathes exhibited in the space of the Stamets company included a 24-27⅛ in., by 11 ft., 16-speed geared-head engine lathe of the Lehmann Machine Co., St. Louis, and a 15 in. by 6 ft. geared head machine of the Sebastian Lathe Co., Cincinnati. Boring and reaming tools, mandrels and arbors were displayed by the Kelly Reamer Co., Cleveland.

An Ohio motor-driven Ohio constant-speed milling machine with "Veeflat" overarm was an improved machine shown by the Oesterlein Machine Co., Cincinnati, which had also a new No. 2 universal tool and cutter grinder in operation. The latter is driven by a single inclosed motor mounted on the column.

Grinding Spindles Operate at 65,000 R.P.M.

The high-speed turbine-driven internal grinding spindle of the Ex-Cell-O Tool & Mfg. Co., Detroit, was a center of interest. It was shown operating at 65,000 r.p.m., in the grinding of 3/32-in. holes, from 0.003 to 0.004 in. being removed. A new item, also on display, was a spindle for grinding holes from ⅛ to 1½ in. in diameter and equipped with an electrically operated governor to maintain spindle speed constant regardless of the depth of cut taken. Standard drill jig bushings were displayed. An electrical device shown by the Ex-Cell-O company for measuring spindle speeds from 20,000 to 100,000 r.p.m. attracted attention. It involves oscillating circuits similar to those used in radio reception. By moving a pointer along a scale a known number of vibrations, variable at will, may be made to synchronize with those of the spindle under test. When the vibrations are in time the speed may be read from the scale.

A new 24-in. constant-speed drive shaper of the Rockford Machine Tool Co., Rockford, Ill., was also exhibited in the space of the Stamets company, and a 24-in. Mechanics production drill of the Rockford company was also under power.

The Hanson-Whitney Machine Co., Hartford, had a universal semi-automatic thread milling machine in operation, as well as a universal tool and die shaping machine and tap sharpening machine. Ground taps, hobs and thread gages were also displayed.

A two-spindle horizontal spline miller, high-speed ball-bearing, vertical miller and a three-spindle drilling machine, with hand feed, power feed and tapping head, were shown by the Taylor & Fenn Co., Hartford. The same company's No. 0 uniform blow spring press was demonstrated in riveting a small part for a Van Dorn portable electric drill. The Morris Machine Tool Co., Cincinnati, had a 3-ft. heavy-duty radial drill with variable-speed motor drive under power. A No. 20 heavy-duty grinder equipped with ball bearings and arranged so that the bearings in the motor are independent of the outboard bearings was a feature of machines of the Marschke Mfg. Co., Inc., Indianapolis.

Independent Exhibits

Among large exhibits not grouped in the spaces of the dealers noted above was that of the Pratt & Whitney Co., Hartford. Six machine tools, all late models, were shown, including a 13-in. model B lathe, a 6-in. model B shaper, an automatic centering machine, which has a new pan bed and has been strengthened throughout, and a double bench outfit with lathe, universal milling machine and drill press. The new indexing table for use on jig borers and other machines was on view, as well as the company's "super-micrometer." The exhibit of gages and small tools was large, and included a new ground thread milling hob. A special display board of tools that have made a record run was a feature. Among these were high-speed tools that have punched over a million holes; ground thread high-speed taps that have tapped more than 100,000 holes; bent shank tapper taps that have threaded more than 250,000 nuts, and Curvex cutters, which are claimed to have milled over 200,000 pieces.

Grinding Machines Include Latest Models

The recently announced full-automatic hydraulic internal grinder of the Heald Machine Co., Worcester, was demonstrated in grinding the bores of ball-bearing races. The machine, designed for mass production, rough grinds the hole, dresses the wheel and finish grinds without any attention by the operator except chucking the work and starting the machine. The style No. 72 semi-automatic internal grinder and the style No. 25 rotary surface grinder were also in operation, as well as a recently developed down-feed No. 25 rotary surface grinder. In the latter machine the principle of the straight in cut has been applied, grinding with the periphery of the wheel being continued as well. The face of the wheel covers the whole width of the work, the heat being said to be distributed over the entire surface. The wheel comes down to a set position at each stroke, giving exactly the same thickness and parallelism. An automatic work feed attachment may be employed. It is claimed that in applying the straight in cut, steel parts can be handled to advantage both for finish and production. With automatic feeding arrangement work up to 5 in. in diameter and 1 in. thick may be ground.

The Landis Tool Co., Waynesboro, Pa., demonstrated its 16 in. by 42 in. crank pin grinding machine, features of which are hydraulic control of the work table and wheel head and the hydraulically operated crank holder clamps. The ease and quickness with which the table can be positioned is stressed as permitting the grinding of all pins without removing the crank from the machine. By pulling a conveniently located rod, the wheel head is brought forward rapidly to the grinding position and stopped automatically. The pin is ground and the push rod and wheel head is carried back to clearance position and stopped automatically. The grinding wheel is 36 in. in diameter. In contrast to this latest model, a large photograph showed the first double-head crank pin grinder built as a standard product by the Landis company in 1904. The first machines used a 24-in. wheel, belt drive rather than direct motor drive, and hand-operated wheel head as against the power-operated wheel head of the present design. A 10 by 36-in. hydraulic traverse plain grinding machine and a 6 by 20-in. hydraulic traverse plain grinder of the Landis company were also under power; the latter is for high production of small work up to 2 in. in diameter.

The Norton Co., Worcester, exhibited its new type B cylindrical grinding machine and also a variety of grinding wheels, Alundum floor and stair tiles and treads and refractories. Six machines, including three surface grinders, two a universal cutter and the improved New Yankee drill grinder, were shown by the Wilmarth & Morman Co., Grand Rapids, Mich. The single stroke surface grinder of the O. S. Walker Co., Inc., Worcester, was exhibited, magnetic chucks being also shown. A Bath universal grinder was shown by the Universal Grinding Machine Co., and a plain cylindrical grinder by the Fitchburg Grinding Machine Co., both of Fitchburg, Mass.

Turret Lathes and Automatics

Several makes of turret lathes were to be seen. The Nos. 1-A and 3-A universal hollow hexagon turret lathes of the Warner & Swasey Co., Cleveland, were exhibited and a new tool for turning tapers directly from the bar was shown. The company's recently developed Roto pneumatic hand grinder was demonstrated.

The Jones & Lamson Co., Springfield, Vt., had three machines in operation, including a 15-in. chucking Hartness

flat turret lathe and a Hartness flat turret lathe, a 2¼ by 24 in. bar machine. A Hartness automatic ground die head was demonstrated in cutting ⅝-11 thread at spindle speed of 420 r.p.m. A Fay automatic lathe was shown machining second-operation automobile ring bevel gears. The Hartness bench-type screw thread comparator was demonstrated and Flanders ground thread taps were displayed.

The Simplimatic of the Gisholt Machine Co., Madison, Wis., was shown in operation, and also the Gisholt 4-B universal turret lathe on a pulley job. Its recently announced precision balancing machine, shown balancing Packard straight eight crankshafts, was a center of interest, as well as a demonstration of how vibration is caused by unbalance.

The Cleveland Automatic Machine Co., Cleveland, had a four-spindle automatic under power making wrist pins for locomotives. Eleven tools were used. The material was 1020 S. A. E. steel 1½ in. in diameter, and the machining time was 52 sec.

The recently announced 12 A tool rotating chucking machine of the New Britain Machine Co., New Britain, Conn., was a center of interest, the company's No. 452 New-Matic chucking machine and No. 204 six-spindle automatic screw machine being also demonstrated.

Two Unimatics of the Potter & Johnson Machine Co., Pawtucket, R. I., were in operation, one rough turning, facing and grooving pistons, and the other on chucked work. The 6-C automatic chucking machine, shown for the first time, was also under power, machining differential carriers. Other machines included the 2-M horizontal automatic machine for continuous milling, in which the operator loads one table while the cutter is milling work mounted on the other table, and a 24-in. universal shaping machine.

A four-spindle automatic chucking machine was exhibited by the Gross & De Leeuw Machine Co., New Britain, Conn., and Lo-swing lathes for the rapid production of duplicate parts by the use of multiple turning tools cutting simultaneously; Short-Cut production lathes and Star screw cutting engine lathes were shown by the Seneca Falls Machine Co., Seneca Falls, N. Y. A Melling cam turning lathe exhibited by the Walcott Lathe Co., Jackson, Mich., was in operation turning Dodge camshafts, the production being at the rate of 30 shafts an hour. The same company showed its gear tooth grinder, which is of pure generating type.

New Milling Machine Shown

A Sunstrand stub lathe tooled for the production of automotive parts was exhibited by the Rockford Tool Co., Rockford, Ill., and in the same space the Rockford Milling Machine Co., had in operation its recently announced Rigidmil. This milling machine is for production work and is a departure from the usual types. Among the features stressed are compactness, ease of operation, permanence of alinement, ability to adjust vertical slide while cutting, oiling necessary only at intervals of 3 to 6 months, advantage to cutter because of maximum rigidity and fly wheel on the spindle and mounting of spindle driving mechanism in Timken roller bearings.

Considerable interest was shown in milling machines demonstrated by the Kearney & Trecker Corporation, Milwaukee. A No. 1-B vertical Milwaukee miller with motor-in-base drive was equipped with special rotary fixture for milling slots in wrist pin set screws. The production was at the rate of 2000 pieces per hour. A 2-B plain miller with new style external motor drive and special reciprocating fixture was milling clutch teeth in small bevel gears, the production being at the rate of 175 to 200 pieces per hour.

The Cincinnati Shaper Co., Cincinnati, demonstrated its heavy-duty Climax shaper, which, among other features, has all speed and driving gears inside the column, automatic sight-feed lubrication and direct reading indicators showing the setting for feed, speed and length of stroke. A universal swiveling table for tool room work was also shown. In planers, the Liberty Machine Tool Co., Hamilton, Ohio, had a late model 36 by 36 in. by 10 ft. unit in operation.

The Leland-Gifford Co., Worcester, had several drilling machines on production work, one of which was a 12-in. motor spindle unit, with a two-speed built-in motor. An E-M Worcester twist drill grinder was also demonstrated. The "Precision" horizontal boring, drilling and milling machine was under power in the space of the Lucas Machine Tool Co., Cleveland, which exhibited also its power forcing press.

Several companies exhibited metal sawing equipment. In addition to upright and bench drilling machines, and pressed steel forges, the Buffalo Forge Co., Buffalo, had its No. 10 bar cutter in operation cutting 3½ in. rounds and other sections, and also its No. ½ universal iron worker. Three nibbling machines of Andrew C. Campbell, Bridgeport, were shown, one being in operation on steel 1/16, ⅛ and 3/16 in. thick and another on ¼, 5/16 and ⅜ in. material.

Local Machine Tool Plants Open to Visitors

Machine tools of the National Acme Co. and Bardons & Oliver, were on exhibition at the Cleveland plants of those companies. A battery of model C, five-spindle Acme automatics in production on various brass and steel parts was inspected by visitors to the plant of the first-named company, and cutting-off machines for bar stock and tubing and a complete line of turret lathes were demonstrated at the showrooms of Bardons & Oliver.

The Ajax Mfg. Co., which because of the large size of its machines was able to demonstrate only working models at its booth at the exposition, invited visitors to its new plant at Euclid. At the plant a 5-in. upsetting forging machine weighting 130,000 lb. was powered for demonstration, as well as a 3-in. unit in conjunction with a hot saw and burring machine producing jaw forging. A 1½-in. machine was also in operation forging rings for ball-bearing races without waste.

Small Tools and Other Equipment

E. C. Atkins & Co., Indianapolis, had in operation its No. 3 metal band saw machine, a No. 18 high-speed hacksaw machine and a No. 7 Kwik-Kut hacksaw machine, all demonstrating the silver steel hacksaw blades. No. 18 was engaged in cutting a 6-in. steel round of 0.30 to 0.40 per cent carbon, making the cut in 16 min. There was also a display of the company's metal cutting saws.

A full line of twist drills, reamers and taps was shown at the booth of the Standard Tool Co., Cleveland, which featured its Red Shield drills and reamers especially designed for automotive work.

A demonstration of the accuracy of universal chucks was the claim for attention at the booth of the Skinner Chuck Co., New Britain, Conn. This is a box body lathe chuck with a solid face, which it is claimed overcomes the defect of the open face in that the solid face prevents the sides from separating under strain. After chucking 185,000 pieces, a chuck was tested by placing a bar between the jaws and tightening them and the amount of deviation was shown to be only 0.003 in.

A new forge drill from solid stock was prominent in the display of the Morse Twist Drill Co., New Bedford, Mass., which also showed a complete line of drills, reamers, cutters, taps, dies, grinding machinery, ground threaded high-speed taps and wood boring drills.

William Ganschow Co., Chicago, displayed speed reducers and samples of cut gearing and of heat treating.

The interesting exhibit of R. D. Nuttall Co., Pittsburgh, was a ring gear such as is used in the electric locomotives in operation on the Virginian Railway and the Norfolk & Western Railroad. The showing also included tractor gears, track wheels for cranes and miter gears for roll tables.

Demonstration of the interlock metal cutting saw in operation was the magnet at the booth of Henry Disston & Sons, Inc., Philadelphia. This is an inserted tooth saw, with a lug that not only holds the tooth in place but makes it impossible to withdraw without breaking the saw. There was a full display of the various kinds of saws made by this company and also of tool steels and the products of these steels.

The Gardner Tap & Die Co., Cleveland, demonstrated its tapper taps in a six-spindle Acme semi-automatic nut tapper.

The Fahrite heat saving carbonizing container was conspicuous in the exhibit of the Ohio Steel Foundry Co., Lima and Springfield, Ohio. This container differs from the carbonizing pots ordinarily used in that the pot is formed of sheet steel and rests on a cast base. This company's display also included a number of miscellaneous castings for high temperature applications.

A new hacksaw frame was shown by L. S. Starrett Co., Athol, Mass. This has an adjustable handle, making it possible by a simple turn to enable the workman to use the saw in difficult places and under conditions that are hard with the fixed handle. Tapes and rules of stainless steel also were featured. Athol vises also were featured and the exhibit of fine tools included a dove tail vernier caliper, which was placed on the market only a couple of months ago, which considerably simplifies caliper readings.

Display of the Union Twist Drill Co., Athol, Mass., embraced ground thread, U. S. S. and Acme thread taps, bent shank tapper taps for the National Machinery Co. automatics, in the Butterfield & Co. division, and ground hobs, high power cutters, ground drills, drill point grinders, hob grinders, form cutter grinders and a complete line of twist drills and milling cutters.

The National Twist Drill Co., Detroit, had in operation a parabolic milling cutter, working on an ingot of steel of 0.30 per cent carbon. The chart of the performance of the machine showed that it cut 37½ in. per minute, the depth of the cut ¼ in., width of cut 5 in., with the spindle making 60 r.p.m. and a surface speed of 70 ft. per min. and a face speed of 30 ft. per min. The display included drills, reamers, cutters, hobs and special tools.

The O. K. Tool Co., Shelton, Conn., featured a grinding fixture to grind sectional and inserted tooth hobs for roughing the larger sizes of gears. This fixture also is adaptable for grinding other large milling cutters. Simplified methods for grinding tool bits made by the company were demonstrated. Milling cutters, boring heads and counterbores with the company's adjustable tooth feature for the maintaining of accurate diameters and widths also were shown.

John Bath Co., Worcester, Mass., displayed prominently a high-speed ground tap, ground from solid steel, made not only in standard but in every conceivable type. The company also featured its internal micrometer and master reference ring.

The Geometric Tool Co., New Haven, Conn., exhibited in operation self opening and adjustable die heads and self opening and adjustable rotary die heads, solid adjustable die heads, adjustable collapsing taps, chaser, grinders, threading machine, milling tools, chucks, collects and other tools.

Interesting drill tests with its Cle-Forge twist drills were made by the Cleveland Twist Drill Co., Cleveland. No attempts were made to break previous speed records as the voltage was insufficient because of the heavy power load in the machinery exhibit. However, numerous tests were made to show the efficiency of the drills. A ¾-in. high-speed drill made 856 holes in 1½ in. cast iron at the rate of 63 in. per min. without being resharpened. A 1¼-in. drill was operated in 1½-in. cast iron at the rate of 112 in. per min. An interesting demonstration was made of drilling sheet brass with small carbon drills for brass in a high-speed sensitive drill press having a speed of 10,000 r.p.m. The object of this demonstration was to show

that faster speed can be developed in drilling in brass than is the common practice.

Exhibits of Steel Companies

Simonds Saw & Steel Co., Fitchburg, Mass., and Lockport, N. Y., displayed a wide variety of saws; also armor plate, used extensively in building protected motor trucks, permanent magnets, and so forth. A split ingot showing the character of the company's steel occupied a prominent place in the booth.

The Slago shrinkhead, made from blast furnace slag and cement, was featured by the Gathmann Engineering Co., Baltimore, which also had exhibits of ingots cast in the ingot molds of the companies using its mold. The slag hot top was advocated as much cheaper than one of refractories.

The Hardtem die block, finding extensive use in drop forge plants, was featured by the Heppenstall Forge & Knife Co., Pittsburgh. This die block is semi-hard, making it possible to sink an impression before hardening.

Practically every article made out of tool and special steels was on display at the booth of the Crucible Steel Co. of America. The company also showed a weldless steel jar, endless Resistal steel belts, superalloy steel machinable at 650 Brinell; special high-speed solid and inserted tooth saws, made by the Hunter Saw & Mfg. Co., Pittsburgh, from the company's steel, as well as a wide variety of tools from high grade crucible and tool steels.

The Donner Steel Co., Buffalo, displayed a number of its own products as well as those made from its steel by other companies. There were automobile axles, a complete automobile transmission, wrenches, hammers, cutlery steel and reinforcing bars. A unique feature was a human skeleton made up from drop forgings by Billings & Spencer Co., Hartford, Conn.

Driver-Harris Co., Harrison, N. J., featured specimens of gray iron castings to which "nichrome" had been added. The castings thus alloyed, the purpose of which is to add hardness and quality affording resistance to abrasion, included cylinder blocks and valves for Diesel engines. The company also displayed carburizing pots, castings for heat-treating applications, glass rolls and cast grids and a working exhibit of spark plugs using the company's special wire, as well as brake band linings made with its wire.

The principal exhibit of the Anchor Drawn Steel Co., Latrobe, Pa., was a board showing the various sizes and gages of cold-drawn steel drill rods made by the company. They varied from 1¼ in. down to 0.013 gage in high-speed and carbon steels. Special shapes, turbine blading, small structural shapes for machine parts and die steels also were shown.

The American Stainless Steel Co., Pittsburgh, controlling many stainless steel and iron patents, displayed many of the products of its licensees. These included kitchen utensils, tubing, stampings, cutlery, wire rope, bolts, butchers' hooks, radiator shells, golf club heads and an evolutionary display of stainless steel sheets.

Carbonizing boxes, lead and cyanide pots and furnace grates of nickel alloy steel were displayed by the Swedish Crucible Steel Co., Detroit. These products are from a nickel chromium alloy, running 62 to 65 per cent nickel and 15 per cent chromium.

The display of the International Nickel Co. ran largely to nickel alloy steel products, including valves, turbine blades, automobile parts, die blocks, shovels, tennis raquets, bearings, tractor shoes, saws, chisels, shot, and pinions and nickel steel ingots with nickel cast iron specimens also shown.

Stainless steel in cutlery and cooking utensils, oil hardening gears, various automotive parts in special steels and tools made from Ketos and Dreadnaught steel were featured by the Halcomb Steel Co., Syracuse, N. Y.

The Jones & Laughlin Steel Corporation, Pittsburgh, displayed cold-finished steel bars of various sections in common demand; parts made from cold-finished free cutting steel and the evolution of a case hardened bolt from the bar.

In the booth of the Midvale Co., Nicetown, Philadelphia, was prominently displayed a 4-throw heat-treated, balanced crankshaft of very high elastic limit in one piece for a Diesel engine. This shaft weighs 3½ tons. Hardened and ground rolls, finished with a mirror surface, also attracted attention. These rolls are for cold sheet and strip mills. Other exhibits included an extrusion ram made of heat-treated steel in one piece; hollow drill steel; forged and rolled alloy steel rings and a chip weighing 6 lb. removed from a piece of heat-treated armor plate, cut on a planer with the company's extra high-speed steel, taking a ⅞-in. continuous cut.

The Pittsburgh Crucible Steel Co., Pittsburgh, displayed a miniature railroad locomotive, in which the forgings of carbon and alloy steels used in building a locomotive were noted. The company also distributed a folder, in which was diagrammed the kinds of steel used in automobile construction.

Ingots and billets of high-speed, alloy and tool steels were shown by the Vanadium Alloys Steel Co., Latrobe, Pa.; also heat-treated specimens, showing the effect of different treatments on the grain structure. Typical uses for these grades of steel also were called to attention.

The exhibit of the Central Steel Co., Massillon, Ohio, embraced a number of special steel products, including ring gears, die block steel, worms, bar and bevel gears, and rolled axles. A rotary drill for oil well drilling, cutters of which are made by this company, also was shown. The company's brass band, the Agathon band, furnished music on Wednesday.

Automobile steels and fabricated automobile parts and Enduro, rustless iron in bars, sheets, tubes, strips in an ingenious corrosion machine using tap water were prominent in the display of the United Alloy Steel Corporation, Canton, Ohio. A number of products fabricated from Enduro also were shown, the four light posts of the booth being of this material.

The Carpenter Steel Co., Reading, Pa., centered its exhibit entirely on tools made from its Stentor brand of steel, an oil hardening, non-changeable tool steel. Intricate dies and production tools were displayed.

Bethlehem Steel Co., Bethlehem, Pa., displayed a number of drop forgings and specimens of high speed and carbon steels. A number of moving illuminated pictures showed the process from the ore to the finished steel.

The Colonial Steel Co., Pittsburgh, as in other years, managed to get into its exhibit some representation of every one of its products. Split tool steel ingots and split heat-treated alloy and tool steel die blocks were shown so as to display the grain and fracture. There were also specimens of high-speed, carbon and alloy steels showing different degrees of heating, and samples of iron, muck bar and all raw materials used in making tool steel.

Rustless steel and iron were featured by the Ludlum Steel Co., Watervliet, N. Y. The light columns of the booth were made from rustless iron, which was rolled to sheets, corrugated and polished; the bases of the columns were also of rustless iron. The principal exhibit of the other steel made by the company was a 750-lb. sectional wheel die, with a record of 68,000 rims per grind, against 2500, the best previous record. There was in operation a complete series of slides showing the operation in tool steel making and a display of photomicrographs.

A complete working small model of a 3-ton electric furnace, which poured heats four times daily of about 25 lb., tin being used because of the fire hazard, drew interested crowds to the booth of the Firth-Sterling Steel Co., McKeesport, Pa. This model was complete down to the water cooling jackets for the electrodes. The company had a display of some of its products and also samples of the raw materials used in their manufacture.

Interstate Iron & Steel Co., Chicago, featured a split alloy steel ingot disclosing its success in keeping the pipe or top cavity well above the hot line. Drop forgings and the abuse they undergo in forging were displayed, as were pictures showing the grain structure in a ring gear as made by the company contrasted with one made by a more common method.

Jessop Steel Co., Washington, Pa., displayed tool and sheet steel and products of a large number of users of its steel by tool manufacturers.

Atlas Steel Corporation, Dunkirk, N. Y., displayed tools made from its steel, forged tire turning tools and high-speed steel drop forgings. Views of the different mill operations at Dunkirk also were shown.

Electric and Gas Furnaces

The exhibit of electric heat treating and melting furnaces was very complete and included a number of new types of furnaces. Many of the furnaces were in operation.

The Strong, Carlisle & Hammond Co., Cleveland, showed a new electric furnace for heating high-speed steel at a temperature of 2350 deg. Fahr., and an electric lead hardening furnace, both equipped with Globar heating units and having automatic control. An interesting exhibit of this company was a large continuous electric furnace for heating small parts. This has a conveyor with variable speed control. The work is discharged through a hermetically sealed chute into a quenching tank, so that no air can pass into the furnace. The exhibit also included oil and gas fired furnaces.

The General Electric Co., Schenectady, N. Y., exhibited drawing, hardening and annealing electric furnaces in operation.

The exhibit of the Hoskins Mfg. Co., Detroit, included in addition to an electric tool hardening furnace, electric control and signal system, pyrometers and chromel thermocouples. One of its exhibits that attracted considerable attention was a thermo pile made of 125 thermocouples heated to 1300 deg. and generating 5 volts of electricity which was used to operate a toy electric train. This company also showed various shapes made from chromel metal.

The W. S. Rockwell Co., New York, exhibited a model of a rotary heating furnace.

A large heat treating furnace of the continuous type for miscellaneous work and having automatic control was shown by William Swindell & Brothers, Pittsburgh. This furnace has a hearth 6 ft. wide and 11 ft. long. The exhibit included photographs of melting furnaces of various types.

The Surface Combustion Co., New York, exhibited photographs of industrial furnaces of various types.

The American Gas Furnace Co., Elizabeth, N. J., exhibited a rotary type of gas carburizing machine, heat treating furnaces of the oven type for high-speed steel with automatic heat control and brass melting and lead hardening furnaces.

A high-speed tool room furnace and a lead hardening pot were included in the exhibit of the Hevi-Duty Electric Co., Milwaukee. This company also showed a heavy duty heat treating furnace and standard types of heat treating furnaces.

The Electric Furnace Co., Salem, Ohio, showed a sample of its furnace wall of T-Grid construction for heat treating, annealing, carburizing and annealing furnaces.

Holcroft & Co., Detroit, had in their exhibit photographs and drawings showing annealing, melting and heat treating furnaces and including electric heat treating furnaces.

The exhibit of the Carborundum Co., Niagara Falls, N. Y., included a gas-fired furnace in operation with a chamber made of tile lined with the company's products and common types of brick to show the relative conductivity of its refractories as compared with common fire clay.

The exhibit of the Westinghouse Electric & Mfg. Co., Pittsburgh, included a hearth type hardening furnace for a temperature of 1850 deg., an electric lead hardening pot for a temperature of 1650 deg., a crucible type furnace for pot heating with a maximum temperature of 1850 deg. and also an electric melting pot. All are provided with automatic temperature control.

The Firth-Sterling Steel Co., McKeesport, Pa., exhibited a working model of a 3-ton electric melting furnace.

A new electric rotary furnace, the outstanding feature of which is the automatic charge and discharge, was exhibited by the George J. Hagan Co., Pittsburgh. This furnace is designed for hardening and annealing gear blanks and other regular shaped pieces on a production basis. The hearth is arranged for variable speed. The furnace shown was 8 ft. in outside diameter and had a 60 kw. capacity, but will be made in various sizes. The company also showed a tool and die block heating furnace.

The Bellevue Industrial Furnace Co., Detroit, exhibited a high-speed furnace.

The American Resister Co., Philadelphia, exhibited furnaces in operation at various temperatures to demonstrate the Globar non-metallic electric heating elements, which are for use at temperatures up to 2450 deg. Fahr.

The Leeds & Northrup Co., Philadelphia, exhibited a new electric furnace for production work in tempering. This has a number of noteworthy features. The furnace is unique in that radiation has been almost entirely eliminated with the substitution of enforced convection heating which is accomplished by the circulation of air from the source of the heat to the work. To make the heat distribution uniform, the direction of circulation is reversed at periodical intervals by means of a reversing fan system. This company also showed its hump type furnace for hardening as well as other types of hardening furnaces and recording and indicating pyrometers and other instruments.

Testing and Other Instruments

The exhibit of testing equipment was very complete and was unusually interesting.

The Tinius Olsen Testing Machine Co., Philadelphia, exhibited a number of testing machines including a 2000 lb. universal machine, a balancing machine for balancing automobile crank shafts and other shafts out of balance and a fly wheel balancing machine which was recently brought out. These balancing machines are designed for correcting both the static and the dynamic unbalance of rotating parts. The company also exhibited several hardness and ductility testing machines and the Herbert pendulum hardness tester which attracted considerable interest.

The Steel City Testing Laboratory, Pittsburgh, exhibited a line of hydraulic Brinell testing machines, including a piston ring tester for diameter and pressure, a dead weight machine, hand or power operated, machines for testing parts too heavy to move, and a power operated machine for productive testing and a hand operated machine for varying loads.

The Brown Instrument Co., Philadelphia, exhibited a new recording pyrometer which makes up to six records and on which the speed of the chart can be changed. It also showed a new instrument for controlling two furnaces at one temperature or at different temperatures, a new electric CO_2 recorder and new valve mechanism for automatic temperature adjustment by stages.

The Bristol Co., Waterbury, Conn., showed a new temperature controller for heat treating furnaces, a new indicating pyrometer and a new oil valve for automatic temperature control.

The Shore Instrument & Mfg. Co., Jamaica, N. Y., exhibited a new direct reading scleroscope. The outstanding features of this instrument are that it has a heavier base and heavier barrel and is more rigid in construction than the company's previous types. A method for testing the hardness for twist drills held in a fixture of rigid construction to avoid vibration was also shown. This company's exhibit included pyrometers, tachometers and other recording instruments.

The Stanley P. Rockwell Co., Hartford, Conn., exhibited a new machine for making the dilatation measurements of steel, known as a dilatometer, which was described in THE IRON AGE issue of Sept. 17.

A metallographic polishing machine for preparing specimens for microscopic examination was exhibited by the Chemical Rubber Co., Cleveland. This machine has four vertical spindles that support polishing plates 8 in. in diameter. Each spindle has an independent drive.

The Bausch & Lomb Optical Co., Rochester, N. Y., showed a new line of equipment for precision measurements. This included a tool maker's microscope for thread work and a profile gage for external threads and optical leveling protractor, a thread profile gage, an optical indexing device and a centering level. This company's exhibit also included a contour measuring projector and metallographic equipment.

The Taylor Instrument Companies, Rochester, N. Y., exhibited a new bi-record recording pyrometer inclosed in a steel case and a new type of pyrometer control, together with various other instruments.

A new electric method of automatic cold junction compensation for pyrometers was shown by the Wilson-Maeulen Co., New York. This company also exhibited a new resistance thermometer and the Rockwell hardness tester for cylinder blocks and other large work.

Charles Engelhard, Inc., New York, showed a new control board automatically operating a miniature tunnel kiln, a valve regulator for fuel fired furnaces, a new electric CO_2 recorder pyrometer, resistance thermometers and other instruments.

The Republic Flow Meters Co., Chicago, exhibited a pyrometer merged in water to show its dust and moisture proof qualities. It also exhibited CO_2 recorders, flow meters, draft gages and pyrometers.

The Pittsburgh Instrument & Machine Co., Pittsburgh, displayed a new continuous and alternating impact testing machine as well as standard Brinell hardness testing machines.

E. Leitz, Inc., New York, exhibited a new model of micro-metallograph and photographed specimens having several new features.

Welding Equipment

Demonstrations of welding were made by the Oxweld Acetylene Co., New York. These consisted of welding ⅜-in. fire box plate, cutting the material into coupons, grinding the welded area and testing on a standard Olsen testing machine under a pressure of 50,000 to 60,000 lb. per sq. in., showing uniformity and strength of weld. It is stated that the demonstrations showed that 80 per cent or more of the coupons broke outside of the weld. This company also showed a complete line of welding and cutting apparatus.

An arc welder and an automatic straight seam welding machine was exhibited by the General Electric Co. Attached to the latter was a special welding head for welding range boilers.

Miscellaneous

The Brown Lynch Scott Co., Monmouth, Ill., exhibited a machine for cleaning and grading carbonizing compound.

Lead pots made of a high heat resisting metal known as thermalloy were exhibited by the Electro Alloys Co., Elyria, Ohio.

A high-pressure lubricating system for the lubrication of machinery bearings from one central point, either continuously automatically operated or manually operated, was exhibited in operation by the Keystone Lubricating Co., Philadelphia.

A line of turbo compressors in various sizes was exhibited by the Spencer Turbine Co., Hartford, Conn.

The William Ganschow Co., Chicago, exhibited three types of speed transformers. These included the direct connected, right angle and vertical types.

E. F. Houghton & Co., Philadelphia, exhibited heat treating products for carburizing, tempering, drawing and quenching, quenching oils, lubricating oils and Vim leather belting.

An air agitator for metal cleaning tanks and metal cleaning solutions were exhibited by the J. B. Ford Co., Wyandotte, Wich.

Cork and various cork specialties for insulating were shown by the Armstrong Cork & Insulating Co., Pittsburgh.

The Case Hardening Service Co., Cleveland, exhibited various materials used in the heat treatment of metals.

The exhibit of the Timken Roller Bearing Co., Canton, Ohio, included a new type of tapered roller bearing having a self alining roller. This company also exhibited various types of roller bearings, seamless steel tubing and a split section of ingot showing the character of the steel used in making its products.

Chemicals for plating and heating were exhibited by the Roessler & Hasslacher Chemical Co., New York.

The Skybryte Co., Cleveland, exhibited and demonstrated a window glass cleaning compound.

The General Alloys Co., Boston, exhibited a very complete line of furnace parts, carburizing parts, including nickel chrome products having high temperature heat resisting qualities. Among new products exhibited were furnace hearth plates and annealing racks.

The Celite Products Co., Los Angeles, Cal., exhibited Sil-O-Cel bricks and the mineral celite from which the bricks are sawed and demonstrated the insulating quality of the brick. They also showed a high temperature brick and various grades of insulating powder.

The Dearborn Chemical Co., Chicago, exhibited a rust preventive compound and powdered cleaning preparations.

The King Refractories Co., Buffalo, N. Y., displayed a line of high-temperature cement.

Selling Safety to Workers

(*Concluded from page* 886)

and merriment was the trial and execution of old "Slippery Scofflaw Accident.' This gentleman scoffed at safety and wandered through the plants advising people that "Safety is all bunk." A description of what followed states:

"Public sentiment reached the breaking point, so April 1 old 'Slippery' was seized by Sheriff John Martin and given the right of trial by jury, though many said he should have been lynched on the spot. He was dragged before Judge Danford's court in the east side machine shop and his case was heard by twelve good men and true. After hearing the evidence the jury returned a verdict of 'guilty of murder in the first degree.' There was no recommendation of mercy, so

How Armco Dramatizes the Fight Against Carelessness. Safety is not a dead issue, however, for a constant campaign is kept up to keep the need for caution continually before employees

old 'Slippery' was placed in a specially constructed cage mounted on a railroad truck drawn by a locomotive decorated in safety colors, and the trip to the gallows was begun. Some three hundred spectators followed on foot. Near the vehicle entrance a gallows had hastily been erected, and here it was that 'Slippery,' in spite of his pleadings, came to a disgraceful end. It was the only act of violence ever attributed to Armco men."

First aid training is an integral part of the safety program. Courses are given under the supervision of competent instructors and classes are so well attended that a waiting list has been created. While this training is now only in its second year, already some 1200 employees hold Government certificates in proficiency.

The safety department has made each worker "safety-minded" by keeping before him the need for exercising caution. The foremen, through having responsibility for accidents, have exerted strenuous efforts in behalf of safety.

But the achievements are not confined to theoretical results. The number of accidents has been progressively declining until last year the major accidents per million work hours averaged 10.5, whereas that for the entire industry was 38.3.

Most startling of all is the revelation, after an investigation by the company, that its workers are twice as safe while on duty as they are away from the plant. They are more likely to be injured either at home or elsewhere while off duty than in the Armco mills.

FREUND STEEL

Product of a German Works Made in a Bosshardt Furnace

The production of a new steel having remarkable tensile strength and toughness is reported in the daily press by dispatches from Berlin. THE IRON AGE has received a description of this steel direct from Edwin Bosshardt, the inventor of the Bosshardt steel furnace with which the steel is produced. A description of the Bosshardt furnace and its products appeared in THE IRON AGE, March 26, 1925.

A feature of the Bosshardt furnace is the high melting temperature maintained, which is upward of 3500 deg. Fahr. By the advantage of this high temperature and of the deoxidizing and purifying properties of the furnace, quality steel is produced from unsorted market scrap, with or without a small addition of pig iron. Ingots and billets of steel of special composition have been made in the Bosshardt furnaces during the ordinary production of steel castings. The Freund Works (Berliner Actien-Gesellschaft für Eisengiesserei und Maschinenfabrikation) operating two 3-ton Bosshardt furnaces, developed the new steel, described as "Freund" steel, especially for use in the production of structural steel shapes and forgings.

Mr. Bosshardt sends certified copies of tests of steel from several heats as follows:

Size of Test Pieces: Diameter 0.8 in.; length 7.88 in. between marks

Block No.	Tensile Strength, Lb. per Sq. In.	Yield Point, Lb. per Sq. In.	Y.P. ÷ T.S., Per Cent	Per Cent Elongation
		Charge No. 1622		
1	75,000	60,700	81	26
2	75,000	60,000	80	26
3	75,000	61,300	81	24¾
4	73,100	59,600	81	26
		Charge No. 1625		
1	75,500	62,100	82	25½
2	75,600	63,200	82	25½
3	76,600	62,500	81	24
4	76,200	60,000	79	24
		Charge No. 1629		
2	74,300	61,400	83	25½
4	74,500	57,500	79	26⅝
		Charge No. 1639		
–	74,500	58,000	79	28

Rolled from 4¾ in. to 6 in. diameter to 1.2 in. diameter.

Sterling H. Bunnell, consulting engineer, 347 Madison Avenue, New York, emphasizes that this steel by reason of its density and freedom from objectionable impurities is thus about 25 per cent stronger than the average low carbon steel, besides possessing high elongation. The strength and toughness is due, he suggests, to the presence of a small proportion of nickel and chrome, perhaps other elements, but the fact remains that the steel is produced from commercial scrap and pig in the Bosshardt furnace and at low cost.

Bosshardt steel furnaces are under construction at the plant of the Wanner Malleable Castings Co., Beloit, Wis., and construction is about to be commenced on furnaces for the Western Iron & Steel Co., Detroit. The American rights are held by the American Bosshardt Furnace Corporation, New York.

"Effect of Wear on the Magnetic Properties and Tensile Strength of Steel Wire" forms the subject of scientific paper No. 510 of the Bureau of Standards. Copies may be obtained from the Superintendent of Documents, Washington, at 5c. each. The work is part of an extended investigation on non-destructive methods of testing wire rope. A machine was developed to reduce the cross section of steel wire by wear. This gave the successive wire thicknesses needed for the examination under way. The results indicate an increase in tensile strength per unit of area, amounting to about 7 per cent by the time the area was halved.

Machinery Markets and News of the Works

BUSINESS IS BETTER

General Run of Machine Tool Buying Has Shown Improvement

There Is a Lack of Railroad Purchasing of Importance, But Miscellaneous Industrial Orders Increase

WHILE the lack of important railroad buying is a disappointment to those companies which specialize in railroad shop tools, the general average of machine tool buying is showing an improvement. Orders are mostly for single machines or small lots, but they are coming from widely diversified industries, indicating that manufacturing activities in many lines are on the upgrade. Production machinery leads in the demand. The recent convention of the American Society for Steel Treating at Cleveland, with its accompanying exhibition of shop equipment, has stimulated considerable buying.

The Chicago, Milwaukee & St. Paul Railroad has ordered a number of large tools at Chicago, but otherwise railroad buying has been confined to single machines. Automobile manufacturers are active and a good share of the current orders are coming from that source.

Cincinnati machine tool builders report a gain in orders for export.

New York

NEW YORK, Sept. 29.

SEPTEMBER machine tool business showed a gain over that of August, but the improvement was moderate, and there are no definite indications of a marked increase in orders during the next month. Railroad buying has been light, which has been a disappointment to those companies which specialize in railroad shop tools. The Amtorg Trading Co., 165 Broadway, New York, the buying agent for the Russian Soviet Government, continues to inquire for machine tools, one of its inquiries calling for upward of 100 gear-cutting machines.

Contract has been let by the National Metal Etching Co., room 1709, 42 Broadway, New York, recently organized, to the Barney Ahlers Construction Corporation, 110 West Fortieth Street, for a three-story plant, 150 x 200 ft., at Long Island City, to cost about $170,000. Parker & Schaffer, 280 Madison Avenue, are architects.

The Davis Equipment Co., 8 West Fortieth Street, New York, is in the market for two dredges, about 15 ft. wide and 33 ft. long, with draft not to exceed 24 in., to operate on endless chain, with capacity of about 45 cu. yd. per hr.

The Board of Education, Albany, N. Y., is considering the installation of manual training equipment in a new three-story and basement junior high school to be erected at Delaware and Myrtle Avenues, to cost $250,000. Marcus T. Reynolds, 100 State Street, is architect.

Bids will soon be asked by the Intertype Corporation, 50 Court Street, Brooklyn, manufacturer of type-setting machines and parts, for its proposed plant at Harrison, N. Y., to cost $550,000 with equipment. A power house will be built. The Ballinger Co., 100 East Forty-second Street, New York, is architect.

Claude Neon Lights, Inc., 1 Pershing Square, New York, manufacturer of electric signs and devices, with plant at 318 East Thirty-second Street, has leased a recently completed building at Long Island City, totaling 20,000 sq. ft. of floor space, for a new plant. It is understood that the present works will be removed to the new location.

The George Haiss Mfg. Co., Park Avenue and 141st Street, New York, manufacturer of wagon loaders, crawler attachments, etc., is completing a one-story addition, 150 x 225 ft., for a new machine and assembling shop.

Edwin Alexander, 240 Mount Hope Place, New York, will erect a three-story automobile service, repair and garage building, 100 x 200 ft., on Mott Avenue, near 140th Street, to cost $200,000 with equipment.

The Keystone Equipment Co., 1947 Broadway, New York, has inquiries out for an Erie type crawler steam shovel, ¾-yd. capacity; a quantity of steel wire rope, 1⅝ to 1⅝-in. diameter; six watertube boilers, to operate at 180 lb. working pressure, and a quantity of steel or iron pipe, 6 in. diameter.

The Consolidated Gas Co., 130 East Fifteenth Street, New York, has completed plans for a power plant and artificial gas works at Hunts Point Road, Edgewater Avenue and the Bronx River, to cost $20,000,000. A general contract for buildings has been let without competition to the William F. Kenny Co., 44 East Twenty-third Street, New York.

The Clark Equipment Co., 616 West Fifty-sixth Street, New York, local representative for Lovejoy shock absorbers, Perfection automobile springs and other automobile accessories, has leased the two-story building at Sixty-fifth Street and West End Avenue, 100' x 100 ft., for a new works.

The Standard Oil Co. of New York, 26 Broadway, New York, has awarded a general contract to the Aberthaw Construction Co., 27 School Street, Boston, for a three-story storage and distributing plant, 146 x 170 ft., with garage and repair shop, at Albany, N. Y., to cost $165,000.

The Flintkote Co., Maple Street, East Rutherford, N. J., manufacturer of roofing, etc., has awarded a general contract to the Ferber Construction Co., 16 Johnson Avenue, Hackensack, N. J., for rebuilding the portion of its plant recently destroyed by fire. It will cost about $50,000. Headquarters of the company are at 21 St. James Avenue, Boston.

The Borough Council, Essex Fells, N. J., plans the purchase of pumping machinery for installation of plant No. 3 of the waterworks system. Edwin C. Speer is borough clerk.

Ovens, power equipment, conveying and other machinery will be installed in the new three-story and basement plant, 130 x 160 ft., to be erected at Irvington, Newark, N. J., by the Drake Bakeries, Inc., 71 Clinton Avenue, Brooklyn, N. Y., to cost $150,000. Seeburger & Rabenold, 1524 Chestnut Street, Philadelphia, is architect.

The Board of Education, West New York, N. J., plans the installation of manual training equipment in its proposed three-story high school to cost $700,000. William Mayer, Jr., 711 Bergenline Avenue, is architect.

Fire, Sept. 22, destroyed a portion of the plant of the General Steel Casting Co., Chapel Street and Lister Avenue, Newark, with loss estimated at $30,000. Plans for rebuilding are under consideration.

The Public Service Electric & Gas Co., Public Service Terminal, Newark, is arranging a new preferred stock issue of $11,550,000, a portion of the fund to be used for extensions in power plants and system.

The Atlas Fence Co., 1 Clinton Street, Newark, manufacturer of iron and wire fencing, has purchased property on Verona Avenue, as a site for a new factory, for which plans will soon be drawn.

The Crane Market

THE volume of new inquiry is still small both in electric overhead and locomotive cranes. The two outstanding lists of cranes that are pending are those of the Andes Copper Mining Co. for about 15 overhead cranes and the Chile Exploration Co. for five A recent addition to pending business in the overhead field is from the General Electric Co., Schenectady, N. Y., for a 10-ton, 3-motor crane for Schenectady and two 2-ton, 3-motor cranes for West Philadelphia. The Brooklyn & Manhattan Transit Co., Brooklyn, N. Y., is asking for prices on two 7½-ton overhead cranes. The Public Service Production Co., Newark, which has a 5-ton hand power crane pending has not yet closed a former inquiry for a 2-ton monorail crane with bucket. The Delaware, Lackawanna & Western Railroad is still in the market for a 15 or 20-ton gantry crane for Paterson, N. J., and a 10 or 15-ton gantry crane for Buffalo. The Wabash Railway Co. is taking bids on two 25-ton overhead cranes for its Decatur, Ill., shops.

In the Pittsburgh district the Youngstown Sheet & Tube Co. is asking prices on two 10-ton, two 30-ton, one 40-ton and one 20-ton cranes for its new seamless tube plant at East Youngstown. The Latrobe Electric Steel Co., Latrobe, Pa., has not yet closed on a 5-ton overhead crane that has been pending.

Among recent purchases are:

Aluminum Co. of America, Pittsburgh, a 25-ton locomotive crane for Saguenay project in Canada, from the American Hoist & Derrick Co.

Spicer Mfg. Co., South Plainfield, N. J., a 20-ton locomotive crane from the Browning Crane Co.

Stecklow Cut Stone Co., New York, a used 5-ton, 35-ft. span overhead crane from N. B. Payne & Co., New York.

New Rochelle Coal & Lumber Co., New Rochelle, N. Y., a 10-ton crawl-tread locomotive crane from the Link-Belt Co.

Colonial Sand & Gravel Co., New York, a 10-ton crawl-tread locomotive crane, reported to have been purchased from the Industrial Works.

Florida East Coast Railroad, a 15-ton, 69-ft. 7-in. span overhead crane from the Niles-Bement-Pond Co. and an 80-ton, 1-motor, coach hoist through Battery & Kipp, engineers, Chicago, from the Whiting Corporation.

Edward G. Budd Mfg. Co., Philadelphia, a 5-ton, 27-ft. 9-in. span crane from the Niles-Bement-Pond Co.

Bradford Brick & Tile Co., Summerville, Pa., a 5-ton grab bucket crane, 25-ft. span, from Manning, Maxwell & Moore, Shaw Electric Crane works.

American Car & Foundry Co., 165 Broadway, New York, four 1-ton, 3-motor, pitting cranes from the Shepard Electric Crane & Hoist Co.

City of New York, a 2-cu. yd. grab bucket crane for waste disposal from the Shepard Electric Crane & Hoist Co.

The Bilmarjac Corporation, Newark, recently organized, has established temporary offices at 972 Broad Street, and has negotiations under way for the purchase of local site for a proposed plant to manufacture electrical appliances and equipment. The initial building will be 90 x 150 ft., to cost $140,000, of which more than $50,000 will be used for machinery. The company is also taking over the plant of the National Vacant Seat Indicator Co., Pomona, Cal., and expects to develop this property as its main works. Additional equipment will be installed. W. J. King is president. Others interested include Charles R. Ford and I. W. Rourk.

The New Aluminum Wheel Corporation, 113 Union Street, Elizabeth, N. J., has been organized with capital of $25,000 to manufacture as indicated. For a time manufacturing will be done by contract, but plans are already under way for the erection of a plant. F. Lambert Patten is president.

New England

BOSTON, Sept. 28.

ALTHOUGH business in machine tools is far from active, it is better than earlier in the month, and an improvement is also noted in the number of inquiries. Among new tools reported sold the past week, four geared head lathes and a shaper with a 12-in. stroke to an eastern Massachusetts shop are the most important. A western Massachusetts manufacturer has given a verbal order for two large machines, but until confirmation is had details are withheld. There appears to be more activity in used tools than heretofore this month. Recent sales include a radial drill, 36 ft. x 28 in. lathe, No. 3 milling machine and three smaller tools to a Southern shop. Other sales largely concern individual machines to other parts of the country, Detroit marking the most Western point and Georgia the most Southern. Sales of individual tools the past week were larger than for any previous similar period in several months. Demand for small tools and machine parts has fallen off.

Bids for the trade school at Bridgeport, Conn., have been returned unopened because of a dispute over title to land upon which it was to have been built.

The Gillette Safety Razor Co., South Boston, has tentative plans for an addition. It is intimated that the new unit will be used for the manufacture of razor blades.

Contractors are figuring on an addition for the N. D. Cass Toy Co., Athol, Mass. Details are lacking.

Bids closed today for a proposed one-story, 60 x 45 ft. mill addition for the Thompson Wire Co., Dorchester, Mass., at the rear of Mildred Avenue. Brainerd Leeds, 89 Franklin Street, Boston, is the architect.

The W. H. Coe Mfg. Co., 74 Weybosset Street, Providence, R. I., gold leaf and jewelry, will erect a two-story, 55 x 65 ft. manufacturing plant. Perry & Whipple, 505 Rhode Island Hospital Trust Building, Providence, are the architects.

The Root Co., Church Extension, Bristol, Conn., hinges and counting machines, will build a four story, 55 x 125 ft. addition. Max J. Unkelback, 52 Main Street, New Britain, Conn., is the architect.

Jonas Harris, Hartford, Conn., has filed plans for a one-story welding and repair shop at 102 Hudson Street.

George N. Jacobs, 4 Park Street, Boston, architect, will soon begin superstructure for a two-story automobile service, repair and garage building, 104 x 200 ft., to cost $180,000 with equipment.

The Jackson Door & Window Co., 95 Canal Street, Boston, has awarded a general contract to the Clark & Lee Co., 77 Summer Street, for a two-story addition to its plant at Everett, Mass., to cost $45,000.

Fire, Sept. 20, destroyed a portion of the power house of the Eastern Massachusetts Street Railway Co., 1 Beacon Street, Boston, at Chealsea, Mass., with loss estimated at $30,000 including equipment.

The P. R. Pratt Mfg. Co., Deep River, Conn., recently organized, has purchased the plant and business of the Potter-Snell Novelty Works, manufacturer of wire and metal goods, consisting of a two-story factory, 30 x 100 ft., with one-story machine shop adjoining, 40 x 120 ft. The new company will continue production and plans expansion. It is headed by Philip R. Pratt, heretofore connected with the acquired company.

The Norfolk Woodworking Co., Quincy, Mass., has taken out a permit to build a new plant at 265-89 Hancock Street, consisting of mill and machine shop, cabinet shop, boiler house and office, to cost $35,000.

E. T. Barlow, Main Street, North Adams, Mass., architect, has plans for a two-story automobile service, repair and garage building, 60 x 160 ft., to cost $80,000.

The Safety Cable Co., Bayonne, N. J., has been organized to take over and consolidate the Safety Insulated Wire & Cable Co. of that city, and the Phillips Wire Co., Pawtuckete, R. I. The two plants will have a combined floor area of 550,000 sq. ft., and will be continued in operation. The new company has arranged for a stock issue of $6,250,000, the proceeds to be used for the consolidation and for proposed expansion. LeRoy Clark is president.

The Standard Oil Co., Putnam, Conn., will rebuild the portion of its local storage and distributing plant destroyed by fire Sept. 19, with loss of $40,000 including equipment.

Ralph O. Dale, Bath, Me., representing New York interests, bid in the property of the Bath Iron Works, Ltd., for $193,100, at an auction sale Sept. 24. He also paid $25,000 for merchandise and supplies on hand. A new company will be formed under Maine laws for the manufacture of engines and pumps. Details are withheld for the present.

Philadelphia

PHILADELPHIA, Sept. 28.

THE Edward G. Budd Mfg. Co., Twenty-fifth Street and Hunting Park Avenue, Philadelphia, manufacturer of steel automobile bodies, will proceed with the construction of a branch plant on an 11-acre tract at Detroit, consisting of a four-story factory, 100 x 725 ft., to cost approximately $1,200,000 with equipment. It will be used largely for finishing operations, giving employment to 2500 persons.

The E. Hubschman & Sons Co., Orianna Street and Willow Avenue, Philadelphia, manufacturer of leather transmission belting, etc., has asked bids for a one-story addition. The Ballinger Co., Twelfth and Chestnut Streets, is architect.

The Jacob Bloom Co., 1049 Frankford Avenue, Philadelphia, manufacturer of cedar chests and kindred products, will soon take bids for a four-story addition to its woodworking plant, 30 x 100 ft., with wing, 21 x 50 ft., to cost close to $100,000 with machinery. William Lowenthal, 1208 Chestnut Street, is architect.

The Stanley Co. of America, Inc., 1916 Race Street, Philadelphia, has completed plans for a steam power house at Filbert and Salford Streets.

The Golding-Keene Co., Trenton, N. J., operating feldspar properties at Keene, N. H., has awarded contract to Beers-Tapman, Inc., Park Row Building, New York, for a one-story grinding and finishing mill at Trenton, 40 x 80 ft., to cost $50,000 with equipment.

The Camden Cold Storage Co., Camden, N. J., a subsidiary of the Terminal Corporation of New Jersey, Inc., is contemplating the construction of a five-story cold storage and refrigerating plant on Kaighn Avenue, to cost $1,500,000 with machinery.

The Board of City Commissioners, Collingswood, N. J., plans the installation of electric-operated pumping machinery at its proposed municipal waterworks station for which a site has been purchased.

The Keystone Screw Co., Yardley, Pa., has placed its local plant on the market, consisting of 17 acres, with buildings totaling 35,000 sq. ft. of floor area.

The Common Council, Lansdale, Pa., is planning extensions and improvements in the municipal electric light and power house with the installation of a 1500-kw. turbogenerator and auxiliary equipment, doubling the present capacity.

The International Motor Co., South Tenth Street, Allentown, Pa., manufacturer of motor trucks, has plans for a one-story addition, 600 x 800 ft., to be known as plant No. 5, estimated to cost $400,000 with equipment. L. H. Cutton is company engineer. L. J. Holmes is vice-president. Headquarters are at 25 Broadway, New York.

Edward W. Peters, Danville, Pa., machinery dealer, has inquiries out for a 200-hp. watertube boiler and accessory apparatus; also for a quantity of 2-ply leather transmission belting, 6 in. wide.

Ovens, power equipment, conveying and other machinery will be installed in the proposed new plant to be erected at North Albany, N. Y., by the Kolb Baking Co., Allentown, Pa., to cost $400,000 including equipment. J. Smith is company architect.

The Bates Valve Bag Co., 8200 South Chicago Avenue, Chicago, has awarded a general contract to the Hughes-Foulkrod. Co., Commonwealth Building, Philadelphia, for a one-story branch plant at Nazareth, Pa., 90 x 200 ft., estimated to cost $50,000 with equipment. It will be used primarily as a foundry.

The West Pittston School District, West Pittston, Pa., is considering the installation of manual training equipment in its proposed two-story and basement high school, to cost approximately $250,000. Mack & Sahm, Coal Exchange Building, Wilkes-Barre, Pa., are architects.

Officials of the Pennsylvania Power & Light Corporation, Allentown, Pa., are organizing two subsidiaries, the Pine Grove-Schuylkill Power & Light Co. and the Tremont-Schuylkill Power & Light Co., to operate in the sections for which named. Plans are under way for power additions and new transmission lines.

The Keystone Motor Car Co., 170 South Washington Street, Wilkes-Barre, Pa., has plans under way for a one-story service, repair and garage building, 94 x 120 ft., with extension, 80 x 90 ft., at Kingston, Pa., to cost $100,000. L. V. Lavy, 45 Owen Street, Forty-Fort, Pa., is architect.

The Spicer Mfg. Co., Pottstown, Pa., manufacturer of universal joints, drop forgings for automobiles, etc., has plans for a one-story addition to its No. 4 building, 60 x 85 ft., to cost $50,000 with equipment. The main plant of the company is at South Plainfield, N. J.

The Emerson-Brantingham Co., will sell at auction its manufacturing plants at Waynesboro, Pa., and Columbus, Ind. The former plant will be sold on Oct. 14 and 15 and the latter on Oct. 20 and 21. Equipment to be disposed of includes lathes, traveling cranes, planers, punches, shears, boring machines, grinders, milling machines, woodworking machinery, foundry machinery and power plant equipment. The compay will concentrate its production in the future at Rockford and Batavia, Ill.

The Eagle Charger Corporation, 121 North Eighth Street, Philadelphia, recently organized with $50,000 capital, will manufacture electrical and radio appliances. It will do its own manufacturing and is in the market for equipment and materials. I. A. Margolies is treasurer.

South Atlantic States

BALTIMORE, Sept. 28.

BIDS are being asked by the Kimball-Tyler Co., Inc., 261 South Eighth Street, Baltimore, operating a cooperage plant, for a one-story shop, 160 x 200 ft., to cost $75,000 with equipment. Stahl & Michel, 100 North Liberty Street, are engineers. William G. Tyler is president.

The Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, is arranging for a new stock issue of about $5,000,000, a portion of the proceeds to be used for extensions and improvements in power plants and system.

Fire, Sept. 23, destroyed a portion of the fertilizer plant of the Summers Chemical Co., Canton, Baltimore, with loss estimated at $250,000, including equipment. Plans for rebuilding are under consideration.

The Mallory Machinery Co., 522 Light Street, Baltimore, has inquiries out for a clam-shell bucket, about ⅝-yd. capacity; one surface condenser, about 2500 sq. ft. capacity; one gasoline-driven trenching machine, Topping or Cleveland type, and one 100-hp. boiler, Economic or Scotch type, to operate at 100 lb. working pressure.

The Chief of Air Service, United States Army, Washington, is asking bids until Oct. 19 for engine parts, including strainer assemblies, gear shaft ball bearing retainers, etc., circular C.A.S. 21.

The Common Council, Scotland Neck, N. C., is considering extensions and improvements in the municipal electric power plant, including additional equipment.

The Shenandoah River Power Co., Strassburg, Va., recently organized to consolidate several electric utilities in Shenandoah, Rockingham and Augusta Counties, has arranged for a bond issue of $410,000, to be followed by a preferred stock issue of $75,000, a portion of the proceeds to be used for extensions and improvements in power plants and system, including transmission lines. The new company will be under the management of Ives & Davidson, 15 Park Row, New York.

M. C. Winston, Warrenton, N. C., is planning the purchase of a quantity of cottonseed oil machinery for a local mill.

The Banana Casing Co., Ellenton, S. C., has leased about 50 acres of land on Four Run Creek and plans the construction of a new veneer and lumber mill to cost $80,000. The machinery will be electrically operated.

The Board of District Commissioners, District Building, Washington, is said to be planning the installation of manual training equipment in the proposed two-story Francis junior high school, to cost about $500,000. A. L. Harris, District Building, is municipal architect.

The American Trade-Financing Corporation, 165 Broadway, New York, represented by R. T. Lipscomb, is reported to have preliminary plans for an automobile service, repair and storage building, 100 x 145 ft., at Richmond, Va., to be known as the Richmond Motor Marts, to cost $850,000 with equipment.

Following the completion of the first unit of its steam-operated electric power plant on the Broad River, Parr Shoals, S. C., the Broad River Power Co., Columbia, S. C., is planning the installation of a second operating unit, with capacity of about 15,000 hp.

Officials of the Lalor Fuel Oil System Co., Inc., 527-33 Colvin Street, Baltimore, have formed a new company of the same name, with capital of 20,000 shares of stock, no par value, to take over and expand the present business and plant. The new organization is headed by James D. Lalor, Robert S. Shriver and Albert E. Marshall.

The Carolina Machinery Co., Sumter, S. C., E. W. Moise, president, is in the market for a shaper, 18- or 20-in. stroke, second-hand, in good condition.

The United States Engineer, Savannah, Ga., is asking bids until Oct. 22 for one 12-in. dredging pump, circular 78.

The Board of Education, Petersburg, Va., plans the installation of manual training equipment in the proposed A. C. Boiling junior high school, to cost $300,000, for which superstructure will soon begin. The Charles M. Robinson Co., Times-Dispatch Building, Richmond, Va., is architect.

The Hackley Morrison Co., 1708 Lewis Street, Richmond, Va., machinery dealer, has inquiries out for a hoisting engine, 8 x 10 in., with double cylinders and double tandem friction drums, without boiler; one channeler, Sullivan type; a quantity of ¼-in. steel plates for truck runway, and one standard sawing machine, Ruggles type, No. 13, with table 40 to 48 in. diameter, either right or left hand, electric-operated.

The United States Engineer, 1068 Navy Building, Washington, will receive bids until Oct. 27 for three hydraulic turbines for water supply service for the District of Columbia.

The Table Rock Furniture Co., Morganton, N. C., has tentative plans under advisement for a new factory to cost $200,000 with machinery. A power house will be built.

The R. S. Armstrong & Brother Co., 676 Marietta Street, Atlanta, Ga., machinery dealer, has inquiries out for an electric generator, about 50-kw. capacity, three-phase, 60-cycle, 220-volt.

Pittsburgh

PITTSBURGH, Sept. 28.

LOCAL machine tool distributors do not seem to be faring as well as those in other centers of the country. There are probably as many shops in this district that require new equipment as in a number of other districts, but here it seems to be the tendency to wait until the need becomes urgent before placing the order. There is a well maintained flow of single tool orders, usually for replacement. September will average up well with August and with September of last year in point of total business, but satisfaction with business is lacking. Makers of standard tools still are making prompt deliveries against orders. Reports that some builders were extending delivery promises do not seem well-founded; there are some companies which have reasonably full order books, and as they are operating with reduced working organizations, they are not promising as quick delivery as they might feel safe in promising with a full complement of men.

The Illinois Steel Co. is installing an electrically-driven 40-in. 2-high reversing blooming mill at its South works. The complete mill will be furnished by the Mackintosh-Hemphill Co., Pittsburgh, and the electrical equipment, consisting of a 7000-hp. reversing motor, with fly-wheel motor generator set and control, will be supplied by the Allis-Chalmers Mfg. Co., Milwaukee.

Fire Sept. 22, destroyed the foundry of the Conemaugh Iron Works, Blairsville, Pa. Surrounding buildings were considerably damaged and the machinery and all patterns in the foundry are a total loss.

The International Nickel Co., 67 Wall Street, New York, will begin construction at its Huntington, W. Va., plant of two buildings, each 65 x 125-ft., for the seamless nickel tubing and nickel polishing departments. A. F. Shoffstall is general manager of the Huntington plant.

The Corry Steam Boiler Works, Inc., East Main Street, Corry, Pa., has tentative plans for rebuilding the portion of its plant recently destroyed by fire. An official estimate of loss has not been announced. James P. Mead is one of the heads of the company.

Fred Fruite, Sharon, Pa., attorney, acting for local interests, has acquired the Sharon-Warren Iron & Metal Co., at a sale in bankruptcy for $50,000. It is said that plans are under way for the formation of a new company to take over and operate the plant.

The Valley Mold & Iron Corporation, Sharpesville, Pa., manufacturer of ingot molds, hearth jackets, etc., has acquired property at South Chicago, Ill., for a branch plant to cost $1,000,000 with equipment. Plans are being completed.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, will soon ask bids for the construction of a four-story and basement addition to its plant at New Brighton, Pa., 50 x 95 ft., to cost $100,000. B. H. Prack, Martin Building, Pittsburgh, is architect.

The National Carbon Company, 30 East Forty-second Street, New York, has plans under way for a new unit at Clarksburg, W. Va., for the manufacture of electrical equipment, estimated to cost $150,000. Construction will be in charge of the engineering department of the organization.

The United States Engineer, Huntington, W. Va., is asking bids until Oct. 3 for axles for rolling lock gates for dams Nos. 14 and 28, Ohio River, and until Oct. 5 for a quantity of high carbon manganese alloy steel plates.

The Pennsylvania Railroad Co., Pittsburgh, will make extensions and improvements at its terminal at Weirton Junction, W. Va., including engine house and machine shop facilities for locomotives on the Steubenville division, ash-handling apparatus, etc.

Charles Allard, Beaver Falls, Pa., operating a garage and service station, is in the market for a small lathe, drill press, cylinder reboring machine, air compressor and other equipment.

George Jones, Sharpesville, Pa., operating a local machine shop, is in the market for equipment to replace that destroyed by fire Sept. 18.

Buffalo

BUFFALO, Sept. 28.

TENTATIVE plans are under consideration by the du Pont Rayon Co., River Road, Buffalo, formerly known as the du Pont Fibre Silk Co., a subsidiary of E. I. du Pont de Memours & Co., Wilmington, Del., for extensions in its power house and mechanical shops in connection with a proposed new mill unit to double the present plant capacity, reported to cost $5,000,000.

The Packard Motor Car Co., Detroit, and 300 Delaware Avenue, Buffalo, has plans under way for a two-story service, repair and headquarters building, 76 x 300 ft., to cost $90,000 with equipment. Albert Kahn, Inc., Marquette Building, Detroit, is architect.

The Brown Paper Co., Ithaca, N. Y., Albert G. Brown, head, has tentative plans for rebuilding the portion of its mill recently destroyed by fire, with loss estimated at $40,000 including equipment.

Fire, Sept. 22, destroyed a portion of the machine and repair shop of Lowman & Waters, 310 East Avenue, Rochester, N. Y., dealers in automobiles. An official estimate of loss has not been announced. It is planned to rebuild.

The Board of Education, Dansville, N. Y., is considering the installation of manual training equipment in its proposed new high school to cost $150,000, for which bids will be asked on a general contract in the near future. Martin C. Miller, 70 West Chippewa, Buffalo, is architect.

The Globe Woven Belting Co., 1396 Clinton Street, Buffalo, manufacturer of mechanical belting, has awarded a general contract without competition to Charles Berricks, 1151 Main Street, for a one-story addition, 78 x 100 ft., to cost $35,000 with equipment.

Marion Chapman, 189 Augustine Street, Rochester, N. Y., is reported in the market for wood-working machinery and transmission and conveying equipment.

The Central Foundry of Medina, Medina, N. Y., which was closed 10 days ago, following the decision of the Central Foundry Co. to confine its efforts to other branches of its business, will re-open shortly under the name of the Tucker Foundry Co. M. E. Tucker, who will operate the plant, has been manager of this branch of the company.

The Dunkirk Dining Car Corporation, Dunkirk, N. Y., recently organized with a capital of $50,000, has plans for the establishment of a local factory for the manufacture of restaurant lunch cars.

Detroit

DETROIT, Sept. 28.

CONTRACT has been let by the Chevrolet Motor Co., Flint, Mich., to the W. E. Wood Co., Detroit, for a one-story addition to its plant No. 7, 80 x 175 ft., to cost $65,000.

The Sunday Lake Iron Co., Wakefield, Mich., will proceed with the erection of a one-story shop, 30 x 108 ft.

The L. A. Young Industries, Inc., 9200 Russell Street, Detroit, manufacturer of automobile equipment, has awarded a general contract to the H. G. Christman Co., Stevens Building, for a one-story addition, 20 x 450 ft., to cost $75,000 with equipment. C. W. Brandt, Kresge Building, is architect.

The Seneca Copper Co., Calumet, Mich., is planning the construction of a new compressor house at its No. 2 Gratiot mines, with the installation of two air compressors and accessories.

The General Necessities Corporation, 2457 Grand River Boulevard, Detroit, is arranging for expansion in its Absopure refrigerator division, and will remove this branch to a new factory where additional equipment will be provided for increase in household refrigerator manufacture.

The Hayes Wheel Co., Jackson, Mich., manufacturer of steel automobile wheels, is said to have preliminary plans for an addition on South Horton Street to cost about $400,000 with equipment.

The Board of County Commissioners, Industrial Bank Building, Flint, Mich., has completed plans for a two-story automobile service, repair and garage building, for county cars, 62 x 145 ft., to cost $65,000 with equipment. MacKenzie & Pratt, Genesee Bank Building, are architects

The Flint Brass Works, Inc., Flint, Mich., manufacturer of automobile specialties is considering plans for a one-story addition. G. J. and S. A. Gutman head the company.

The National Production Co., 2999 Bellevue Avenue, Detroit, manufacturer of automobile equipment, has awarded a general contract to Knott & Slezinski, 3126 East Forest Street, for a one-story addition, 65 x 200 ft., to cost $50,000 with equipment. Albert Kahn, Inc., Marquette Building, is architect.

The Stewart-Warner Speedometer Corporation, 7321 Woodward Avenue, Detroit, has awarded contract to the Jones-McNally Co., 120 Washington Boulevard, for a two-story and basement service, repair and headquarters building, 100 x 150 ft., to cost about $75,000.

Clarence T. Warner, Benton Harbor, Mich., operating a local plant recently established for the manufacture of special automobile lamps, is considering the installation of additional equipment to increase the capacty from 500 to 2500 lamps per day.

The Mount Clemens Sugar Co., Mount Clemens, Mich., has an expansion program under way to cost close to $100,000, including the installation of additional equipment at its beet sugar mill. The slicing department will also be enlarged.

The Sorg Engine Mfg. Co., 307-309 Green Street, Owosso, Mich., recently incorporated, will combine an engine with the necessary electrical equipment and market a farm power plant. It will build a new type of internal combustion motor and is in the market for production machinery, castings, drop forgings, foundry supplies, studs, cap screws, crank shafts, etc. William A. Sorg heads the company.

The Benton Harbor Forging Co., Benton Harbor, Mich., awarded contract to the Max W. Stock Construction Co. for an addition, 39 x 60 ft., to its hammer shop.

Cleveland

CLEVELAND, Sept. 28.

MACHINE tool sales by manufacturers and dealers were in good volume the past week. Orders were more numerous than for some time, but for the most part were for single machines. Buying was stimulated by the machinery exhibit in connection with the convention of the American Societey for Steel Treating, held the previous week, and considerable of the business placed resulted from prospects that developed during that exposition. Sales were confined largely to improved types of production machinery. The volume of business generally during September will show some gain over August. There is not much activity at present in the automotive industry, but machinery manufacturers report considerable business in prospect from that source, particularly in automatic machines.

The Cleveland Board of Education is taking bids this week for a miscellaneous lot of foundry equipment for the Collinwood high school. Included in this list are a brass and aluminum melting furnace, tumbling barrel, core oven and grinding machine.

The Lang Body Co., 3088 West 106th Street, Cleveland, has placed the general contract with R. S. Ursprung for a factory addition.

The Ashtabula Bow Socket Co., Ashtabula, Ohio, has taken bids for a one-story factory, 40 x 100 ft.

The city of Cleveland will take bids about Oct. 1 for a new sewage disposal plant at Cuyahoga Heights. Considerable equipment will be required, including two 20,000,000-gal. and one 15,000,000-gal. motor-driven centrifugal pumps. George B. Gascoigne, 1149 Leader-News Building, is the consulting engineer. The estimated cost is $3,000,000.

The Buckeye Traction Ditcher Co., Findlay, Ohio, has awarded contract to Alge Brothers, Findlay, Ohio, for a one-story forge shop, 38 x 100 ft.

The Ohio Edison Co., Springfield, Ohio, is having preliminary plans prepared for a steam power house with 26,000-hp. capacity, to be built along the Mad River in Clark County. C. I. Weaver is the general manager. Shilling & Eastman, 926 Fairbanks Building, Springfield, are the architects for the building.

The Paper & Textile Products Co., Sandusky, Ohio, manufacturer of paper and textile machinery, contemplates the erection of a factory addition. W. H. Millspaugh is president.

The Heller-Murray Co., Youngstown, has been awarded contract to rebuild the foundry on Poland Avenue of the Youngstown Foundry & Machine Co., destroyed by fire several months ago.

The Falcon Bronze Co., Youngstown, is rebuilding its factory on South Phelps Street, destroyed several weeks ago when the walls, weakened by excavations for a building adjoining, collapsed. In the meantime the company's orders are being filled at its plant on Poland Avenue, recently acquired from the Lumen Bearing Co.

The Youngstown Welding Co., W. D. McKay, president, manufacturer of Weldco truck tanks and engaged in light plate construction, will erect a new factory, 70 x 200 ft., along the Youngstown & Austintown Railroad, Youngstown. The present plant is at 536 West Rayen Avenue, but the company requires additional space for expansion. Construction of the new building will be undertaken next spring.

Chicago

CHICAGO, Sept. 28.

MACHINE tool business has shown improvement. September sales have been considerably better than those of August and about equal to those of July, which was one of the best months of the year. The bulk of current business covers a wide variety of machine tools, and it comes from well diversified sources. Considerable interest is being manifested by household utility manufacturers and makers of metal lamp stands. There is no difficulty on the score of deliveries, although on certain classes of the lighter tools demand appears to be just about even with the production.

The Chicago, Milwaukee & St. Paul has closed for the following tools outstanding against its previous lists: One journal turning and quartering machine, one driving wheel lathe, several draw-cut shapers, several pieces of tool room equipment and a number of miscellaneous used tools, among them engine lathes and bending rolls. The Nash Motors Co. has placed a number of scattered orders for machine tools for its Kenosha, Racine and Milwaukee plants. The Rock Island has bought an air brake cylinder grinder and has asked for information which leads the trade to believe that it is preparing its spring list. Industrials which are actively in the market include the A. O. Smith Corporation, the Allis-Chalmers Mfg. Co., and the Hannum Mfg. Co., Milwaukee; the American Can Co. and the International Harvester Co., Chicago. The J. I. Case Threshing Machine Co., Racine, Wis., has bought several turret lathes. Information is being sought on steam drop hammers and upsetters by the Pittsburgh Knife & Forge Co., Pittsburgh, Pa.

The Central Cold Storage Co., 350 North Dearborn Street, Chicago, will erect a cold storage plant at 1444 South Sangamon Street, to cost about $60,000.

C. W. Greenfield, 117 North Jefferson Street, Chicago, will construct a two-story brick machine shop, 33 x 126 ft. P. A. Weber, 155 North Clark Street, is architect.

John Weber has had plans by B. J. Bruns, 1548 Belmont Avenue, for a three-story mill construction factory, 40 x 167 ft., at 5118 West Ravenswood Avenue, Chicago, at an estimated cost of $80,000.

The Marblehead Lime Co., 160 North La Salle Street, Chicago, has awarded a general contract to Dwight P. Robinson, Inc., 125 East Forty-sixth Street, New York, for a new one-story plant, 40 x 220 ft., to cost $55,000. The contractor will also act as architect and engineer for the work.

The Grant Storage Battery Co., 116 North Second Street, Minneapolis, Minn., will build a new two-story plant, 40 x 125 ft., to cost $40,000 with equipment. O. L. Schutz is president.

The Standard Oil Co., Mankato, Minn., will begin the construction of a new storage and distributing plant on local site to cost $100,000 with equipment.

The Cutler-Magner Lime Co., Eighth Avenue, Duluth, Minn., has awarded a general contract to Barnett & Record, Flour Exchange Building, Minneapolis, Minn., for a one-story addition, 80 x 125 ft., to replace the portion of its works recently destroyed by fire. It will cost about $40,000.

The Universal Crusher Co., 625 Avenue C, West, Cedar Rapids, Iowa, has awarded a general contract to E. D. Monilaw, 1558 Second Avenue, East, for a one-story and basement addition, 40 x 87 ft. Norman Hatton, O. R. C. Building, is architect.

The Elgin Clock Co., National Street, Elgin, Ill., will ask bids early in October, for a one and two-story addition, 65 x 300 ft., to cost $150,000 including equipment. Graham, Anderson, Probst & White, 80 East Jackson Boulevard, Chicago, are architects.

The State Board of Administration, State Capitol Building, St. Paul, Minn., has authorized plans for a new power house at the State Teachers' College, Bemidji, Minn., to cost about $100,000 with equipment. C. H. Johnston, Capital Bank Building, St. Paul, is architect.

The Board of Education, Luverne, Minn., plans the installation of manual training equipment in its new two-story high school to cost $200,000, for which superstructure will soon begin. The Architectural Co., Luverne, is architect.

The Twin City Separator Co., 1701 Madison Street, N. E., Minneapolis, Minn., manufacturer of mechanical separating equipment, will break ground for a one-story addition, 65 x 100 ft., to cost $25,000. The Bland Engineering Co., Kennedy and L Streets, is engineer.

Manual training equipment will be installed in the proposed three-story and basement boys' high school to be erected at Lake and Illinois Streets, Rockford, Ill., by the Catholic Church, 1704 National Avenue, Rockford, for which bids are being asked on a general contract. It will cost $250,000. W. J. Van Der Meer, Meade Building, is architect.

Milwaukee

MILWAUKEE, Sept. 28.

FAIRLY active business is the rule among Milwaukee machine tool builders, and the dealer trade as well is viewing the future with greater hopefulness. Automotive industries remain the best customers, and while they are not buying a large number of tools of certain types at one time, their miscellaneous requirements contribute to a relatively satisfactory aggregate. It is apparent that the call for equipment will soon broaden, with more shops finding it necessary to increase capacity at least to a small extent. Replacement business is growing larger as well. Used machines are being absorbed at a moderately satisfactory rate.

The Seamless Steel Products Co., Twenty-seventh and Greves Streets, Milwaukee, is starting construction on a one-story shop addition, 50 x 86 ft., to cost about $45,000 including equipment. The general contract has been let to the Meredith Brothers Co., 253 Washington Street. The Seamless company manufactures drawn steel products. E. J. Lansing is president.

The Hudson Mfg. Co., Minneapolis, Minn., manufacturer of farm machinery, tools, implements and barn equipment, probably will rebuild its branch production center at DePere, Wis., badly damaged by fire Sept. 21, with an estimated loss of $100,000. The DePere plant was built in 1905 by the Western Steel & Iron Works, which in 1919 was absorbed by the Hudson company. Practically the entire tool and machine equipment was ruined and will require replacement. E. J. Abendroth is general manager at DePere.

The Smith Engineering Works, 1134-1154 Thirty-second Street, Milwaukee, manufacturer of rock, ore and gravel handling machinery, has broken ground for the first unit of its new plant at Lake Boulevard and Holton Street. The first building will be a machine shop, 200 x 250 ft., of brick and steel, and the general contract has been placed with the Worden-Allen Co., local. It will cost about $350,000, including the equipment to be added to the layout of the present plant. Charles F. Smith is president and treasurer.

The Kiel Woodenware Co., Kiel, Wis., has plans by W. F. Neuman, architect, 114 Grand Avenue, Milwaukee, for a $40,000 manufacturing addition, 35 x 150 ft., bids for the erection of which will be taken after Oct. 1.

The Milwaukee Department of Public Works is in the market for three stokers, two vacuum pumps and one feed water heater as further requirements of the equipment of the new municipal service building under construction, the estimated cost of which is $300,000. Some of the machine tool equipment has been placed, but the bulk of the needs remains to be disposed of. Roland E. Stoelting is commissioner of public works.

The Wisconsin Valley Electric Co., 206 Third Street, Wausau, Wis., is about to start work on the erection and equipment of a general machine and service shop, garage and warehouse for its mechanical department. It will be 80 x 142 ft., part two stories and basement, and was designed by Oppenhamer & Obel, architects, Wausau and Green Bay, Wis., who will close bids about Oct. 3 or 5. Harold L. Geisse is general manager.

Cincinnati

CINCINNATI, Sept. 28.

SALES of machine tools reached liberal proportions the past week. The Cleveland convention of the American Society for Steel Treating was an influential factor in securing prompt action on many pending inquiries. Automobile makers continue to be the principal buyers, while railroads are slow in closing for their requirements. Purchases of companies in the general industrial field have increased, and more orders are coming in for a multiple number of machines. The largest sale of the week was that of 12 lathes by a local builder. The Louisville & Nashville has postponed action on its list, which is said to include a planer and approximately 10 lathes, although placing of this business is expected within the next 10 days. It is reported that the Southern Railway will erect new shops at Knoxville to replace those recently destroyed by fire and that equipment will be purchased shortly.

Foreign business has aroused interest, partly due to the activity of foreign dealers in disposing of American machinery. Two large plants have been working on tools for Italian delivery, while local builders have received orders from Japan, India, Germany and several other countries. Planer manufacturers declare that sales are better than for several months. The Seaboard Air Line bought a large planer. The Cincinnati Planer Co. booked a 36-in. planer for the Ajax Motor Co., Racine, Wis., a similar machine for the Aluminum Mfg. Co. and a 48-in. planer for the Giddings & Lewis Tool Co.

Lathe builders state that sales have been sustained on a high level. The Chrysler Motor Corporation purchased four lathes locally, while the International Harvester Co. bought three machines. A Cincinnati lathe company received an order for a 30-in. lathe for shipment to Massachusetts.

The call from automobile makers for automatic lathes has been well maintained. September has been one of the best months of the year for sales of shapers. A Detroit automobile manufacturer bought three shapers from a local builder, and the John Steptoe Co. sold a 20-in. shaper to a Minneapolis school. Boring mill companies report sales of several single machines. Production of milling machines and centerless grinders has been brisk. Drill manufacturers are pleased with the volume of business on hand. The Niles-Bement-Pond Co. sold a 42-in. carwheel borer to the American Railroad of Porto Rico. A local dealer disposed of a jig boring machine to a manufacturer in this city.

Pending business is of large proportions. A lathe builder states that he has quotations out on machines valued at approximately $100,000, while another machine tool manufacturer figured the past two weeks on nearly the same amount of business.

The Smith Scale Co., 265 West Spring Street, Columbus, Ohio, has purchased the Anglidine Scale Co., Elkhart, Ind. Equipment of the latter company will be moved to Columbus. J. G. Sims, president Anglidine Scale Co., will become general manager of the combined plants.

Charles Anderson and R. S. Radcliffe, receivers for the Hamilton Machine Tool Co., Hamilton, Ohio, have rejected the bids for the company's machine tools, which were made at auction on Sept. 15.

The city of Dayton, Ohio, will start construction soon on a new electrical waterworks plant, plans for which have been drawn by Metcalf & Eddy, Boston engineers. Bids on nine motor-driven pumps for the proposed plant will be received by George Baker, service director, until Oct. 15.

The Eastern Machinery Co., 408 East Pearl Street, Cincinnati, which has been incorporated for $50,000, will con-

tinue to sell used machinery. New officers of the company will be elected soon. Harry F. Oberhelman is manager.

U. S. Engineers' Office, P. O. Box 72, Louisville, Ky., will receive bids until Oct. 26 for furnishing, delivering and erecting gates for Ohio river locks No. 46 and No. 49.

Nathan R. Park, 1420 Union Trust Building, Cincinnati, receiver for the James H. Curran Elevator Co., 114 West Second Street, Cincinnati, will receive bids until Oct. 6 for the company's metal and wood-working machinery.

Fire, Sept. 24, destroyed the plant and most of the equipment of the Simpson Foundry & Engineering Co., Newark, Ohio, with a loss of $45,000. Plans for rebuilding are said to be under consideration.

J. W. Wilcox, Sr., Irvine, Ky., has plans underway for the erection of a commercial oil shale refinery on a site recently acquired. The project will represent an investment of $1,000,000 and will include brick and cement plants and power house.

The Fischer Special Mfg. Co., Cincinnati, manufacturer of screw machine products, has moved into its new two-story plant at Morgan and Dover Streets. C. Harry Fischer is president and treasurer, and F. H. Fischer vice-president and secetary.

Arthur Mingay has purchased the interests of the Dayton Bronze Bearing Co., Dayton, Ohio, in the Oakley Brass Foundry Co., South Street, Cincinnati. The name of the latter concern will be changed to the Triumph Brass Foundry, which will be incorporated with Mr. Mingay as general manager. The company will do a general brass foundry jobbing business.

The Beach Enameling Co., Coshocton, Ohio, has plans under way for a one-story addition, 60 x 150 ft., to cost about $50,000 with equipment.

The Foskett-Brown Mfg. Co., Nashville, Tenn., recently organized with a capital of $100,000, has leased a local building for the establishment of a plant to manufacture valves, temperature control equipment, etc. Foskett Brown is president and treasurer.

The Tennessee Electric Power Co., Chattanooga, Tenn., is said to be arranging a fund of $1,200,000 for proposed extensions and improvements. The work will include an addition to the steam-operated generating plant at Nashville, Tenn., with the installation of a 15,000-kw. turbo-generator and accessory equipment to cost $500,000; additions in the steam-operated power plant at Hale's Bar, with a new 12,000-kw. turbo-generator, to cost $350,000, and extensions in the Chattanooga district to cost $400,000.

The Gulf Red Cedar Co., Lebanon, Tenn., is said to be planning to rebuild the portion of its mill recently destroyed by fire with loss of about $50,000, including equipment.

The City Council, Dickson, Tenn., plans the installation of pumping equipment in connection with proposed extensions in the municipal waterworks, for which bonds for $25,000 have been voted.

The Southern Cities Utilities Co., Chattanooga, Tenn., has acquired the plant and system of the Sequatchie Light & Power Co., operating at Hohenwald and Petersburg Tenn. Plans are under advisement for the construction of additional power plants to serve these and other communities in the southwestern section of the State, with the building of additional transmission lines.

The Hillerich & Bradsby Co., 725 South Preston Street, Louisville, manufacturer of turned wood products, has acquired property adjoining its plant and will remodel for an addition. New wood-turning and finishing machinery will be istalled.

The L. J. Breed Equipment Co., 824 James Building, Chattanooga, Tenn., machinery dealer, has inquiries out for an iron ore jig, from 50 to 100 lb. capacity..

St. Louis

ST. LOUIS, Sept. 28.

THE Missouri Hydro-Electric Power Co., Kansas City, Mo., has preliminary plans for a hydroelectric generating station on the Eleven Point River, near Thomasville, Mo., to cost $500,000.

The Common Council, Tuttle, Okla., will install electric-operated pumping equipment in connection with a proposed municipal waterworks, for which bonds for $38,600 have been voted. The Gantt-Baker Co., 1116 West Main Street, Oklahoma City, Okla., is engineer.

The Larutan Fuel Co., Wichita, Kan., operating natural gas properties and pipe lines, is disposing of a bond issue of $2,000,000, a portion of the proceeds to be used for extensions and improvements. C. W. Sears is president.

The Borough Council, Siloam Springs, Ark., plans the installation of a municipal electric light and power plant, including boiler, engine, generator and accessory equipment. J. R. Abercrombie is chairman of the water and light board, in charge.

The Abernathy Furniture Co., 1513 West Ninth Street, Kansas City, Mo., has awarded a general contract to J. G. Barnes, Leavenworth, Kan., for a new four-story and basement plant at Leavenworth, 82 x 300 ft., with one-story power house and dry kiln building, 50 x 105 ft., to cost in excess of $100,000, including equipment.

The Board of Education, Kansas City, Kan., is considering the installation of manual training equipment in its proposed three-story and basement high school at Thirty-sixth Street and Springfield Avenue, to cost $200,000. Rose & Peterson, Brotherhood Building, are architects.

The Killark Electric Mfg. Co., 3940 Easton Avenue, St. Louis, is reported to be planning to rebuild the portion of its factory recently destroyed by fire. An official estimate of loss has not been announced.

The Missouri Utilities Co., Cape Girardeau, Mo., will make extensions and improvements in its power plant and system to cost about $200,000. Work has been started on an addition to the local steam-operated power plant, to include the installation of a new generator and auxiliary equipment.

The Jacob Guth Tractor Co., 1109 High Street, St. Louis, has been organized with capital of $100,000 to manufacture tractors. Plans for manufacturing are incomplete, but it is likely that parts will be made by contract, the company operating a plant for assembling. The tractor is of steel construction and weighs about 1900 lb. Bevel and other gears will be let out by contract.

Tonkawa, Okla., is having plans prepared by the Ruckel Engineering Co., Arkansas City, Kan., for a proposed municipal electric light and power plant, estimated to cost $140,000.

Gulf States

BIRMINGHAM, Sept 28.

CONTRACT has been awarded by the Texas & Pacific Railroad Co., Dallas, Tex., to the Ware Co., El Paso, Tex., for a one-story machine shop and engine house near Fitzhugh Avenue, Dallas, where a yard development to cost close to $1,000,000 is in progress. Plans are also under way for a ten-story terminal warehouse and freight depot.

The Common Council, Big Spring, Tex., plans the installation of pumping machinery in connection with a proposed municipal waterworks to cost $30,000, for which bonds have been approved.

The Agricola Furnace Co., Gadsden, Ala., has awarded a general contract to the Ingalls Iron Co., 720 Avenue D, Birmingham, for a new plant to manufacture warm air furnaces, consisting of one-story foundry, 90 x 215 ft.; mounting and assembling shop, 60 x 220 ft.; sand blast department, 50 x 80 ft.; cupola room, 40 x 40 ft., and core room, 30 x 40 ft., to cost $90,000 with equipment. It is proposed to develop a capacity of about 1,700 furnaces a month.

The West Texas Compress & Warehouse Co., Lubbock, Tex., has begun the construction of a cotton compress to cost approximately $150,000, including presses and auxiliary machinery. T. M. Nowlin is general manager.

Fire, Sept. 21, destroyed a portion of the plant of the United States Welding Co., Miami, Fla., with loss reported at $22,000 including equipment. It is planned to rebuild.

The Town Council, Bushnell, Fla., is asking bids until Oct. 14 for equipment for a municipal waterworks, including one electric-operated pumping unit and one gasoline-driven pumping unit, each with capacity of 500 gal. per min., one steel tank and tower, 75,000 gal. capacity, and auxiliary equipment. E. V. Camp & Associates, Inc., Jacksonville, Fla., is engineer. C. B. Allen is town clerk.

The West Florida Ice & Ice Cream Co., Bradentown, Fla., recently organized with a capital of $100,000, is arranging for a one-story ice-manufacturing plant with capacity of about 50 tons per day. A cold storage and refrigerating plant is also under consideration. George V. Denny, Bradentown, heads the company.

The Southern Fountain & Fixture Co., Dallas, Tex., manufacturer of soda fountains and accessories, has foundations in progress for its three-story and basement plant at 1900-1906 Cedar Springs Road, estimated to cost $70,000. A general contract was let recently to Y. G. Davis, Dallas.

The City Council, Floresville, Tex., is considering the installation of pumping equipment in connection with extensions and improvements in the municipal waterworks, for which a bond issue of $40,000 has been approved.

The Kaye-Repsher Ice Co., Meridian, Miss., is said to have closed negotiations for the purchase of a site adjoining its plant and contemplates the early construction of an addition to cost $50,000 with equipment.

The Dade County Board of Public Instruction, Miami, Fla., plans the installation of manual training equipment in its proposed Shenandoah junior high school, to cost $250,000, for which bids are being asked on a general contract until Oct. 6.

The Southern Rock Asphalt Co., Louisville, is reported to be considering the construction of a new mill at Flint, Ala., to cost approximately $200,000 with machinery. L. D. Powell is general manager.

Fred F. and C. F. Peterson, 1005 Mercantile Bank Building, Dallas, Tex., architects, will proceed with the construction of a three-story automobile service, repair and garage building, 130 x 250 ft., to cost $150,000 with equipment.

The Palm Lake Co., Inc., Lake Worth, Fla., recently organized, has tentative plans for a new eight-story cold storage and refrigerating plant, 100 x 100 ft., to cost $95,000 with equipment. The company is also considering the erection of a one-story ice manufacturing plant. George E. King is president.

The Southeastern Power & Light Co., Birmingham, a holding company for the Alabama Power Co., has arranged for an increase in capital to 3,600,000 shares of stock, a considerable portion of the proceeds to be used for extensions and improvements in power plants and system. Thomas W. Martin is president.

The Prairie Pipe Line Co., Mexia, Tex., is considering rebuilding the portion of its local storage and distributing plant recently destroyed by fire, with loss estimated at $125,000 including equipment.

The Higgins Lumber & Export Co., Maison Blanche Annex, New Orleans, has tentative plans for a new saw mill on the Navigation Canal, to cost $75,000 with machinery.

Samuel H. Sorrell, Ashland, Ala., is planning to purchase machinery for the establishment of a wood-working mill for the manufacture of automobile spokes and other turned wood products.

The W. C. Gilmore Corporation, 703 North Sixth Street, Waco, Tex., has been organized to manufacture acetylene gas generators, fixtures, coolers, etc. It has a factory and is in the market for materials, including galvanized sheets, pipe, fittings, stove bolts, brass springs, solders, brass casing, etc. W. G. Gilmore is president.

The Central Texas Power Co., Childress, Tex., has preliminary plans for the construction of a one-story ice manufacturing plant to cost approximately $100,000 with machinery.

Indiana

INDIANAPOLIS, Sept. 28.

THE Lock Joint Pipe Co., Elston, Ind., is arranging for a new two-story plant, 50 x 75 ft., to cost about $40,000 with equipment. It will replace a portion of the plant recently destroyed by fire. W. W. Harriman, New Richmond, Ind., is architect. S. P. Harrison is superintendent.

The T. A. Bartlett Co., Chicago, has acquired the plant of the Majestic Engine Co., Goshen, Ind., and will convert the factory for the manufacture of electric storage batteries and other electrical apparatus.

The Board of Public Works, South Bend, Ind., has completed plans for a one-story automobile service, repair and garage building for municipal cars and motor trucks, to cost $45,000.

New interests have acquired a substantial portion of the stock of the Stilwell Sand & Gravel Co., Anderson, Ind., for $150,000, headed by M. A. Mavielle, general manager of the Western Gravel Co., Indianapolis. Plans are said to be under consideration for extensions and the installation of additional equipment.

Paul Taylor, Huntington, Ind., local representative for the Ford automobile, has plans for a two-story addition to his service, repair and garage building, 65 x 87 ft., to cost $30,000 with equipment. R. W. Stevens, Citizens' Bank Building, is architect.

The Vonnegut Hardware Co., Indianapolis, will soon begin the erection of a six-story storage and distributing plant, 195 x 202 ft., to cost $500,000 with equipment. It will be used for the warehouse, jobbing and milling departments. Vonnegut, Bohn & Mueller, Indianapolis, are architects.

The Parker Rust Proof Co. of Indiana, Inc., Indianapolis, recently organized, will operate a plant at 820 North New Jersey Street, for the manufacture of specialties for preventing the corrosion of iron and steel products. Elmer Davis is president and secretary.

The Chrysler Motor Corporation, Newcastle, Ind., will install additional machinery at its local plant, using about 90,000 sq. ft. of floor space vacated recently by the service department, which has been removed to Dayton, Ohio. It is expected to provide facilities for the employment of about 500 additional persons. Ledyard Mitchell is vice-president.

The Indiana Piston Ring Co., Hagerstown, Ind., has recently purchased the manufacturing building formerly occupied by the Teetor Hartley Motor Corporation. New machinery will be purchased to equip this additional space.

Pacific Coast

SAN FRANCISCO, Sept. 23.

WORK will begin on the proposed plant of Johns-Manville, Inc., 500 Post Street, San Francisco, at Pittsburg, Cal., with main four-story building, 100 x 500 ft., and smaller structures, including power house and machine shop, to cost $850,000 with equipment. Headquarters are at Madison Avenue and Forty-first Street, New York.

Ashley & Evers, 58 Sutter Street, San Francisco, architects, have plans for a five-story and basement automobile service, repair and garage building, to cost $250,000 with equipment.

The Penstock Construction Co., Sharon, Pa., Fred M. Strecker, president, is reported to be planning the construction of a new works at Oakland, Cal., for the manufacture of riveted steel pipe, to cost $250,000 with equipment.

The Westminster Paper Mills Co., Bellingham, Wash., headed by J. J. Herb, will soon begin the construction of the first unit of a new mill, estimated to cost $75,000. Other units to be built later will increase the investment to $300,000.

The City Council, Ellensburg, Wash., is considering extensions and improvements in the municipal electric power plant, to cost $100,000 including additional equipment. Barr & Cunningham, Spalding Building, Portland, Ore., are engineers.

The Evergreen Lumber Co., Berrydale, Wash., has tentative plans for rebuilding the portion of its sawmill and lumber plant recently destroyed by fire, with loss approximating $100,000 including equipment.

The Pacific Gas & Electric Co., 245 Market Street, San Francisco, has preliminary plans for a new hydro-electric generating station on the Stanislaus River, to cost about $2,300,000. A steel tower transmission system will be built. The project will be carried out in conjunction with its subsidiary, the Sierra & San Francisco Power Co.

The Oakland Brick Co., 1636 Franklin Street, Oakland, Cal., recently organized, plans the establishment of works for the manufacture of fire brick and face brick near the Foothill Boulevard, about five miles from the city. A fund of $100,000 has been arranged for initial operations. E. P. Fisher is company representative.

The F. S. Lang Mfg. Co., 2756 First Avenue, South, Seattle, manufacturer of stoves and ranges, has awarded contract to the C. L. Morris Construction Co., Smith Building, for a one-story addition, 60 x 150 ft.

The Union Ice Co., 354 Pine Street, San Francisco, has acquired a 3-acre tract at Reno, Nev., and will erect a one-story ice-manufacturing plant, 100 x 120 ft., to cost $200,000. H. V. Lloyd is local manager.

The Washington Water Power Co., Spokane, Wash., contemplates the construction of a hydro-electric generating plant on Lake Chelan. The project, including transmission lines, will cost $7,500,000.

The Pioneer Boiler & Machine Works, Inc., 2528 Santa Fe Avenue, Los Angeles, Cal., will immediately build a new plant to take care of increased business.

Canada

TORONTO, Sept. 29.

WHILE the majority of sales run to single tools, business in general is showing improvement. The automotive industry continues an active buyer and the railroads are placing orders for single machines from time to time. A few of the larger industrial concerns have appeared in the market recently with small lists, but buying from this quarter has been comparatively light for some time. Good demand and inquiries are appearing at intervals for tools for garages and machine and repair shops. Small lot buying features the small tool industry.

The London Box Mfg. & Lumber Co., London, Ont., has started work on repairs to its factory and will be in the market for woodworking tools and equipment.

The Neptune Meter Co., Ltd., 1197 King Street West, Toronto, will remove its plant to larger quarters at 345 Sorauren Avenue about Jan. 1. Some additional equipment will be required.

The Norwich Electric, Ltd., Norwich, Ont., has purchased the former Molson Bank Building, and plans to remodel for the manufacture of electric fixtures. The owner will be in charge of all details and proposes to start work immediately. W. C. Hunt is manager.

Plans are being prepared for four new units for the St. Maurice Paper Co. at Three Rivers, Que., to cost $5,000,000. Head office of the company is in the Canada Cement Building, Montreal.

The Weir Machinery Co., Pacific and Richards Streets, Vancouver, B. C., has awarded the general contract for the construction of a machine shop on Granville Island to Peter Tardiff, 3391 Twenty-second Avenue West, Vancouver.

Foreign

THE Municipal Council, Sydney, Australia, will soon ask tenders for a new steam-operated electric generating plant, with installation to include six turbo-generators, each of 25,000 kw. capacity; eighteen watertube boilers, stokers, condensers, pumping machinery, switchboard apparatus and auxiliary equipment. Transmission and distributing lines, with substations, will also be built. The entire project is estimated to cost $12,000,000.

The American Chamber of Commerce in France, 32 Rue Taitbout, Paris, France, has received an inquiry (A-3161) from a company at Paris, desirous of getting in touch with American manufacturers of drying machinery.

The United Sugar Co., Los Mochis, Mex., has plans for the construction of a hydroelectric generating station on the Fuerte River, near the Sinaloa-Chihuahua state boundary, with extensive transmission system for mining and other industrial service in Chihauhua. The project will include an irrigation system, with pumping plants, etc., and is estimated to cost $6,500,000.

The Mexican-Panuco Oil Co., 40 Wall Street, New York, is arranging for an increase in capital from $3,000,000 to $5,000,000, a considerable portion of the proceeds to be used for plant construction and development of a 1,000,000-acre oil concession recently secured in South America, including oil well machinery, refining equipment, etc.

The State Electric Co., Montevideo, Uruguay, is asking bids until Dec. 28 for 1,060,000 meters of insulated copper wire. Specifications on file at the office of the electrical equipment division, Bureau of Foreign and Domestic Commerce, Washington.

Trade Changes

The Federal Tool & Alloy Steel Corporation, Brooklyn, N. Y., has changed its name to the Swedish Iron & Steel Corporation.

The Ex-Cell-O Tool & Mfg. Co., Detroit, has appointed the following representatives throughout the United States and England during the last few months: E. D. Bishop Co., Perry Payne Building, Cleveland; A. E. Coburn, 12 Sterrett Place, Crafton, Pittsburgh; James O. Coleman, 831 North Eighth Street, St. Louis; Albert T. Fisher, 500 Bell Block, Cincinnati; R. W. Hansen, 4742 Kenmore Avenue, Chicago; Kemp Machinery Co., 215 North Calvert Street, Baltimore; W. A. Laub Co., Franklin Trust Building, Philadelphia; Oscar H. Lorange, 830 Old South Building, Boston 9; Ivan M. Lytle Co., 1305 Sutter Avenue, San Francisco; J. W. Mull, Jr., 412 Board of Trade Building, Indianapolis; Walter Phillips, Autor Car Auxiliaries, Ltd., Letchworth Herts, England; Triplex Machine Tool Co., 50 Church Street, New York; A. V. Wiggins Co., 384 West Fayette Street, Syracuse, N. Y.

The Bridgeport Safety Emery Wheel Co., Bridgeport, Conn., announces that it has appointed Manning, Maxwell & Moore, Inc., as national distributer of the Bridgeport line of grinding and polishing machinery. The Bridgeport Safety Emery Wheel Co. will continue to market direct its sectional grinding wheel chucks and grinding wheels.

The Electric Controller & Mfg. Co., Cleveland, announces the appointment of Eicher & Bratt, Seattle, as representatives for the sale of EC&M control equipment in Oregon, Washington, Alaska and part of Idaho. Eicher & Bratt also represent in their territory the Pittsburgh Transformer Co., Jewell Electric Instrument Co. and the Electric Power Equipment Corporation.

Maurice Land and Samuel S. Land have established a new store and office, trading as the Champion Electric Motor Co., 187 Centre Street, New York, for buying and exchanging new and rebuilt electric motors, generators, motor generator sets and general electrical power equipment.

The General Asphalt Co., Barber Asphalt Co. and the Trinidad Lake Asphalt Operating Co., Ltd., have moved their offices from 1900 Land Title Building to 1600 Arch Street, Philadelphia.

The Independent Pneumatic Tool Co., manufacturer of Thor pneumatic tools and electric tools, has opened a branch office at 288 East Water Street, Milwaukee, where a complete stock of pneumatic tools, electric tools, spare parts and accessories will be carried. G. H. DuSell, who has traveled the Milwaukee district handling tools for many years, will be in charge.

The Kuhlman Electric Co., Bay City, Mich., announces the appointment of the D. H. Braymer Equipment Co., 727 W. O. W. Building, Omaha, Neb., as district representative in Iowa and Nebraska.

The Detroit office of the Bantam Ball Bearing Co., Bantam, Conn., is now in charge of J. Harold Kraus, Jr., at 3780 Chicago Boulevard. Mr. Kraus will handle the entire Michigan territory and also Toledo, Ohio.

The Conveyors Corporation of America, 326 West Madison Street, Chicago, announces the appointment of Rowland & Burns, 39 Cortlandt Street, New York, as district engineers for New York and vicinity, handling the sale of American steam jet ash conveyors, American air tight doors, cast iron storage tanks, rack and pinion ash gates and other conveyor specialties.

The Haynes Stellite Co., manufacturer of Stellite metal cutting tools and other articles of high speed and corrosion resisting alloys, has just completed concentration of the company's activities at its plant in Kokomo, Ind. All service in connection with the company's products will hereafter be extended direct from the plant. Headquarters for administration, sales and engineering activities will be at Kokomo, these being conducted under the direction of C. G. Chisholm, general manager.

Victor J. Greene, Swissvale, Pa., has acquired the two-story plant, 120 x 120 ft., of William J. Miller on Center Street, heretofore devoted to the manufacture of glass machinery, for a consideration of $50,000. The purchaser is said to be planning to continue operations.

The Johns-Manville Co. of Massachusetts has just taken a long lease in the new Central Building, Worcester, Mass.

Clarence A. Cowles, Plantsville, Conn., has purchased the plant of the Peck, Stow & Wilcox Co., Summer Street, Southington, Conn.

The Watson-Fry Co., Bath, Me., maker paper mill machinery, will shortly announce the completion of a reorganization. H. E. Tidmarsh, formerly with the Union Iron Works, Bangor, Me., is manager, and F. B. Oldham, president.

The C. F. Bulotti Machinery Co. has moved from 71 Main Street to 29 Folsom Street, San Francisco, because of the necessity of securing larger quarters.

W. H. Daub & Co. Inc., Alaska Building, Seattle, Wash., has been appointed representative of the Koppel Sales Co. in the Pacific Northwest. William L. Rawn is manager of the Seattle firm.

The Boston Cylinder Grinding Co. has leased part of the street floor at 9 to 11 Harcourt Street, Boston, which it will shortly occupy.

The Cleveland Graphite Bronze Co. has moved its offices and factory from 2906 Chester Avenue, Cleveland, to larger quarters at 880 East Seventy-second Street.

S. W. Platt & Co., scrap iron and steel dealers, with a yard at McKees Rocks, Pa., have opened city offices at 708-9 Oliver Building, Pittsburgh.

The Air Reduction Sales Co., 342 Madison Avenue, New York, has created a new sales district following the purchase of the Gas Tank Recharging Co., Milwaukee, with acetylene plants in Milwaukee and Bettendorf, Ia., and a carbide plant at Keokuk, Ia. District sales office will be located at 1296 Forest Home Avenue, Milwaukee, in charge of J. S. Strate. The new territory includes Michigan, Wisconsin, Illinois and Iowa.

The Reading Chain & Block Corporation, with main offices and works at Reading, Pa., has opened an office in New York, at 90 West Street, in charge of R. E. Nelless.

Motch & Merryweather, Cleveland, have taken the agency for the Union Twist Drill Co., Athol, Mass., manufacturer of hob grinders, twist drill point grinders, etc.

The Detroit office of the Bantam Ball Bearing Co., Bantam, Conn., is now in charge of J. Harold Kraus, Jr., at 3780 Chicago Boulevard. Mr. Kraus has had many years experience in the field.

The Diamond Power Specialty Corporation, Detroit, announces that the territory of the Lathrop-Trotter Co., 733 Union Trust Building, Cincinnati, sales representatives for the Diamond corporation in the Cincinnati district for many years, has been extended to take in Indianapolis and the adjacent territory in central and southern Indiana.

Current Metal Prices

On Small Lots, Delivered from Stocks, New York

THESE prices are given for the convenience of small-lot buyers whose requirements do not run into mill-size orders.

Only base prices can be listed in some cases, due to limits of space; other items of a given group are deducible from the base price.

The prices which are quoted below are those at which small lots may be bought, whether from jobbers' or other stocks.

Complete market reports and prices on large shipments from mills will be found elsewhere under "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates

	Per Lb.
Bars:	
Refined iron bars, base price	3.24c.
Swedish charcoal iron bars, base	7.00c. to 7.25c.
Soft steel bars, base price	3.24c.
Hoops, base price	4.49c.
Bands, base price	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	3.34c.
Channels, angles and tees under 3 in. x ¼ in. base	3.24c.
Steel plates, ¼ in. and heavier	3.34c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.30c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.65c.
Toe-calk, ½ x ⅝ in. and larger	4.20c.
Cold-rolled strip, soft and quarter hard	7.00c.
Open-hearth spring steel	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds and hex.	4.00c.
Squares and flats	4.50c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High-speed steel, 18 per cent tungsten	70c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.89c.
No. 12	3.94c.
No. 14	3.99c.
No. 16	4.09c.

Box Annealed—Black

	Soft Steel C. R. One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	3.70c. to 3.95c.	.....
Nos. 22 and 24	3.75c. to 4.20c.	4.35c.
No. 26	3.80c. to 4.25c.	4.40c.
No. 28*	3.90c. to 4.35c.	4.50c.
No. 30	4.10c. to 4.55c.	.....

Galvanized

	Per Lb.
No. 14	4.00c. to 4.35c.
No. 16	4.15c. to 4.50c.
Nos. 18 and 20	4.30c. to 4.65c.
Nos. 22 and 24	4.45c. to 4.80c.
No. 26	4.50c. to 4.95c.
No. 28*	4.90c. to 5.25c.
No. 30	5.40c. to 5.75c.

*No. 28 lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
⅛ in. Butt	46	29	½ in. Butt	4	+19
¾ in. Butt	51	37	¾ in. Butt	11	+ 9
1-3 in. Butt	53	39	1-1½ in. Butt.	14	+ 6
2½-6 in. Lap	48	35	2-in. Lap	5	+14
7 & 8 in. Lap	44	17	3-6 in. Lap	11	+ 6
11 & 12 in. Lap.	37	12	7-12 in. Lap	3	+16

Bolts and Screws

Machine bolts, cut thread, 40 and 10 per cent off list
Carriage bolts, cut thread, 30 and 10 per cent off list
Coach screws, 40 and 10 per cent off list
Wood screws, flat head iron,
80, 20, 10 and 5 per cent off list

Steel Wire

Base, Price† on No. 9 Gage and Coarser	Per Lb.
Bright, basic	4.25c.
Annealed, soft	4.50c.
Galvanized, annealed	5.15c.
Coppered, basic	5.15c.
Tinned, soft Bessemer	6.15c.

†Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	19⅛c. to 20⅛c.
High brass wire	19⅝c. to 20⅝c.
Brass rods	16⅞c. to 17⅞c.
Brass tube, brazed	27⅛c. to 28⅛c.
Brass tube, seamless	23¾c. to 24¾c.
Copper tube, seamless	24¾c. to 25¾c.

Copper Sheets

Sheet copper, hot rolled, 21¾c. to 22¾c. per lb. base.
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20
IC	$11.25	$8.85
IX	12.85	10.85
IXX	14.40	12.55
IXXX	15.75	13.85
IXXXX	17.00	15.05

Coke—14x20	Prime	Seconds
80 lb.	$6.15	$5.90
90 lb.	6.30	6.05
100 lb.	6.45	6.20
IC	6.65	6.40
IX	7.85	7.60
IXX	9.00	8.75
IXXX	10.35	10.10
IXXXX	11.35	11.10

Terne Plates

8 lb. coating, 14 x 20

100 lb.	$7.00 to $8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire-door stock	9.00 to 10.00

Tin

Straits, pig	60c.
Bar	65c. to 67c.

Copper

Lake ingot	16¾c.
Electrolytic	16½c.
Casting	16 c.

Spelter and Sheet Zinc

Western spelter	9¼c.
Sheet zinc, No. 9 base, casks	12½c. open 13c.

Lead and Solder*

American pig lead	10½c. to 12½c.
Bar lead	12½c to 13½c.
Solder, ½ and ½ guaranteed	40c.
No. 1 solder	37c.
Refined solder	30½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c. to 90c.
Commercial grade, per lb.	35c. to 50c.
Grade D, per lb.	25c. to 35c.

Antimony

Asiatic	20c. to 21c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), ingots for remelting, per lb.	31c. to 34c.

Old Metals

The market is very dull. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	12.00
Copper, heavy wire	11.75
Copper, light bottoms	9.50
Brass, heavy	7.25
Brass, light	6.00
Heavy machine composition	9.00
No. 1 yellow brass turnings	8.50
No. 1 red brass or composition turnings	8.25
Lead, heavy	7.75
Lead, tea	6.25
Zinc	4.50
Cast aluminum	18.50
Sheet aluminum	18.50

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THE IRON AGE

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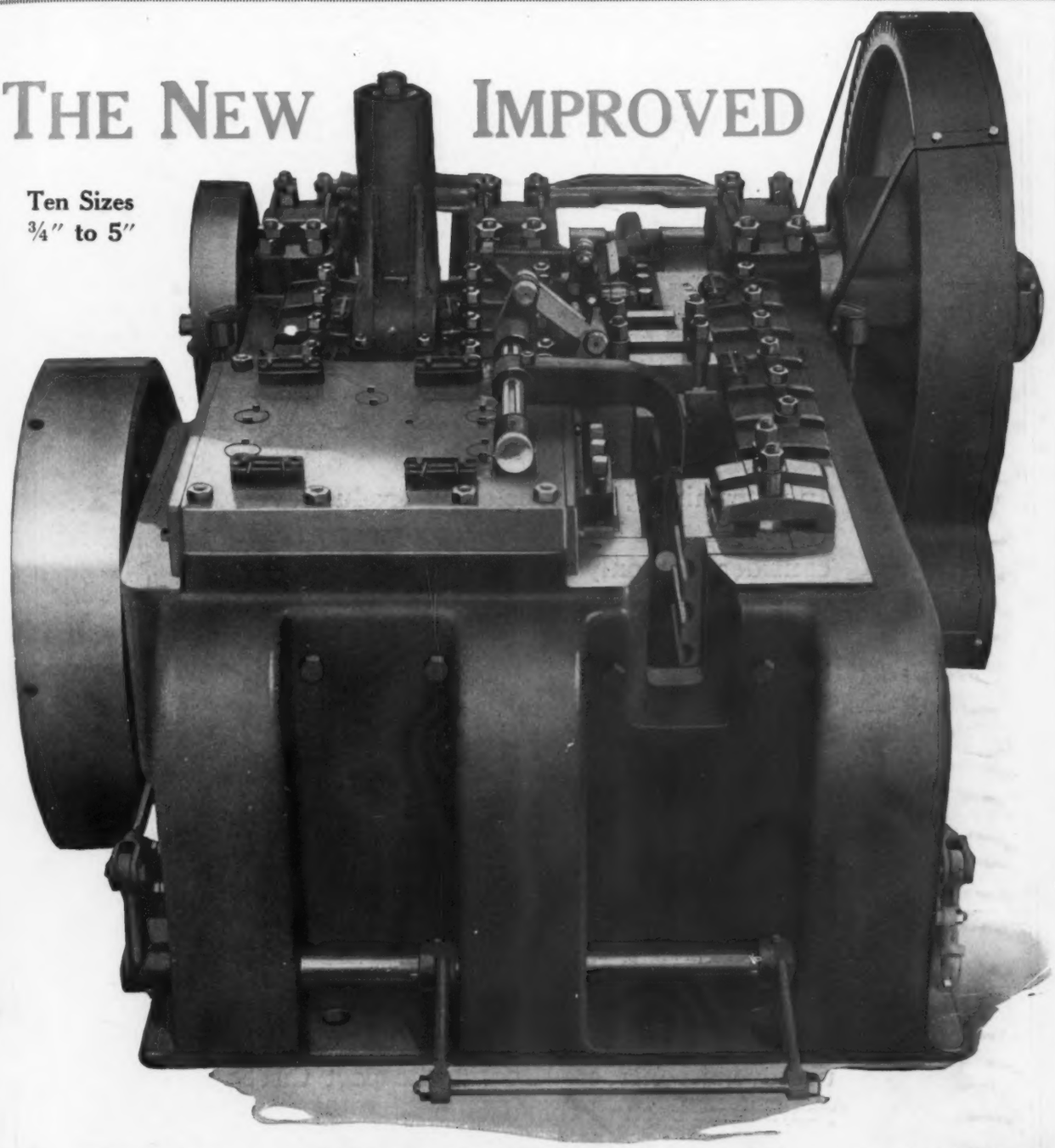

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Becker Type Combination Coke and Gas Ovens

In determining the type of by-product oven to be built, the iron and steel company must consider not only present requirements of coke and gas, but possible future requirements, especially the amount of gas that will be required.

THE BECKER TYPE COMBINATION COKE AND GAS OVEN which can be heated with coke oven gas, producer gas, blast furnace gas or blue water gas, is designed to take care of present and future demands for gas.

That the iron and steel industry recognizes the advantages of this oven is demonstrated by the fact that virtually all of the by-product ovens contracted for in the past three years have been of this design.

The Koppers Company

Pittsburgh, Penna.

Chicago, Ill. New York City